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Rapid Transit Service Sufficiency Study

JUNE 1984



Draft Final Report
New York City Transit Authority
Department of Planning and Budget





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PREFACE

RAPID TRANSIT SERVICE SUFFICIENCY STUDY

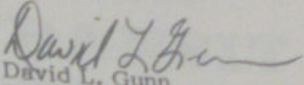
The draft final report of the Rapid Transit Service Sufficiency Study presents several proposals to change train routings to reflect certain changes in passenger travel patterns and needs.

The Study, begun in 1978, deals with reroutings of existing services and does not represent a comprehensive proposal for all possible or necessary improvements in service patterns, nor does the Study deal with rationalization of the Rapid Transit and Bus Systems. Moreover, utilization of the new 63rd Street Tunnel is not addressed.

The data and analysis upon which the proposed train reroutings are based in the report will become a base on which to build future service planning efforts, using a data base previously unavailable to the Transit Authority.

At this time, the Authority's highest priorities are to restore the structural integrity of the Rapid Transit System and to improve service reliability to acceptable levels. These efforts must take precedence over route and service changes which do not directly address these basic priorities. The Authority will establish in 1985 an Operations Planning Department within the Operating Division with improved capability of analyzing and proposing needed service changes. The new organization will increase management and technical expertise in the area of service planning. The new managers will use the Study's information and recommendations to help implement, on an incremental basis, the service adjustments required throughout the Authority.

In the interim, the Authority will focus on the other aspects of service sufficiency that directly affect improving the state of the System. The data base compiled in the course of this Study will continue to be used in the Authority ongoing service planning efforts. Further, the proposals outlined herein will be periodically reevaluated as potential elements of future service improvements designed to address the overriding priority of the Authority — providing efficient and reliable transit service to New York City.


David L. Gunn
President
New York City Transit Authority

December 20, 1984

FINAL DRAFT REPORT



**CITY-WIDE
RAPID TRANSIT
SERVICE SUFFICIENCY
STUDY**

UMTA Project No. IT-09-0046/89 C-670

June 1984

PARTICIPATING AGENCIES

U.S. Department of Transportation
Urban Mass Transportation Administration
Tri-State Regional Planning Commission
New York City Transit Authority

**PREPARED BY THE
NEW YORK CITY TRANSIT AUTHORITY
DEPARTMENT OF PLANNING AND BUDGET
OPERATIONS PLANNING GROUP**

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TABLE OF CONTENTS



<u>Executive Summary</u>	Page
<u>Chapter One/Introduction</u>	iv
Study Purpose and Objectives	1
Study Origins	2
<u>Chapter Two/Origin-Destination Surveys</u>	
Survey Design	3
Survey Card Design	5
Pilot Survey	6
Survey Administration	8
Data Reduction	11
Survey Results	17
<u>Chapter Three/Evaluation of Alternatives</u>	
Guidelines for Developing Alternatives	18
Alternatives Analysis	19
Review of Potential Capital Improvements	107
Operating Cost Estimates	109
Proposed Route and Service Changes	110
<u>Chapter Four/Community Participation</u>	
Community Participation Structure	112
Community Participation Methodology	113
Community Participation Chronology	115
<u>Chapter Five/Station Access Analysis</u>	
Station Access Analysis Methodology	121
Station Access Data Base	122
<u>Chapter Six/Conclusions</u>	125
<u>Appendices</u>	
A. Description of Output Tables	
B. Passenger Benefit Matrices	
C. Rapid Transit Recommendations from The Bronx Service Sufficiency Study	
D. Study Staff	

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TABLE OF FIGURES



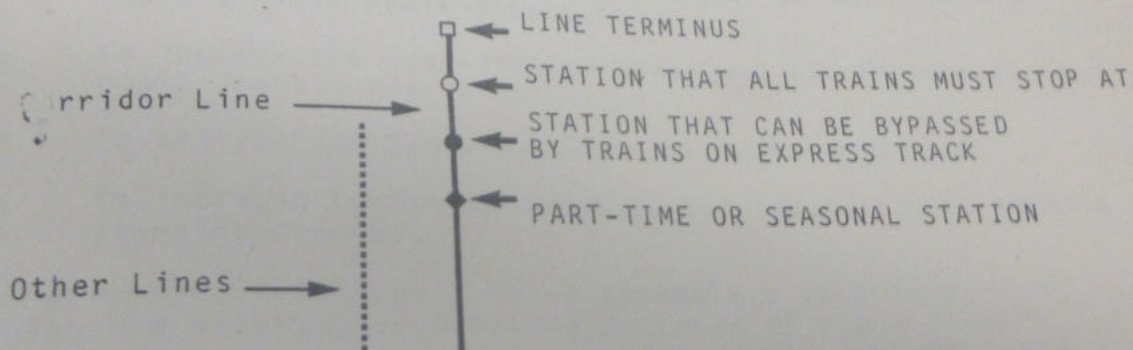
Figure	Description	After Page
1	New York City Rapid Transit System	1
2	Entering Weekday Passenger Volumes By Hour	4
3	Pilot Survey Card	6
4	Final Survey Card	8
5	Survey Car Card	8
6	Survey Report Sheet	8
7	Example Of Directional Bias At Stations	9
8	Evening Survey Locations	9
9	Evening Survey Card	10
10	Pilot Evening Survey	10
11	Theatre Survey Locations	10
12	Weekend Survey Locations	10
13	Beach Survey Locations	10
14	Example of UTPS Zones	10
15	Track Diagrams: Brooklyn Bridge	12
16	IND Upper Manhattan/Bronx Corridors	19
17	Central Park West Demand	21
18	Washington Heights Demand	23
19	Grand Concourse Demand	24
20	Track Diagrams: West Fourth Street	24
21	Queens Boulevard-Astoria Corridors	25
22	Queens Boulevard Demand	35
23	Astoria Demand	37
24	Track Diagrams: Queens Plaza	37
25	Track Diagrams: Canal Street	40
26	Flushing Corridor	41
27	Eastern Division Corridors	53
28	Peak Eastern Division Demand	56
29	Off-Peak Eastern Division Demand	58
30	Track Diagrams: Rockaway Parkway	58
31	Track Diagrams: Broadway Junction	60
32	Fulton Street-Rockaways Corridor	61
33	Fulton Street-Rockaways Demand	70
34	IRT Brooklyn Corridor	72
35	Culver Corridor	76
36	Culver Line Demand	85
37	People-Minutes Saved By "F" Express	86
38	Southern Division Corridors	87
39	Peak Fourth Avenue-Sea Beach-West End Demand	90
40	Off-Peak Fourth Avenue-Sea Beach-West End Demand	93
41	Brighton Line Demand	94
42	Brighton Line Zone Analysis	96
43	Peak Travel to Lower Manhattan	96
44	Potential Capital Improvements	98
45	Route Change Proposals	107

TABLE OF FIGURES
(Continued)

Figure	Description	After Page
46	Community Boards Affected By The Sixth Avenue/Upper Manhattan Proposals	116
47	Community Boards Affected By The Queens Boulevard-Astoria Proposals	117
48	Community Boards Affected By The Eastern Division Proposals	118
49	Community Boards Affected By The Southern Division Proposals	119
50	Summary Of Community Board Responses	120

EDITOR'S NOTE: The RTSSS alternatives analysis was completed in March 1983. Costs, operations, and ridership figures described in this report reflect that date, unless otherwise noted

LEGEND FOR CORRIDOR MAPS



EXECUTIVE SUMMARY



In September 1978, the New York City Transit Authority initiated the Rapid Transit Service Sufficiency Study (RTSSS), the first comprehensive, systemwide origin-destination survey in the history of New York City's rapid transit system. Its purpose was to appraise the overall rapid transit system, its purpose was to transit services and effectiveness and sufficiency of rapid responsive to passengers and restructure those services in a manner more limits of the Authority's current travel patterns, within the cars, and financing). Its available resources (that is: labor, objectives were:

- o To assemble a comprehensive data base for rapid transit route and service planning.
- o To assess and analyze the sufficiency of the existing rapid transit route structure.
- o To improve the cost-effectiveness and attractiveness of rapid transit operations.
- o To analyze and improve access to subway stations.
- o To increase community input to the rapid transit service planning process.

As proposed, RTSSS would first assemble a data base containing the existing trip-making patterns of rapid transit riders and other characteristics relating to the current rapid transit system. The major input to this data base would come from a series of comprehensive origin-destination surveys, encompassing weekday, weekend, and seasonal travel.

The systemwide survey distributed survey cards at every rapid transit station between 6AM and 2PM---times chosen to represent the period when approximately 40 percent of the daily ridership enters the system. A mail-back survey card was selected as the most practical survey instrument. Cards were distributed to entering passengers at almost every control area in the system. The systemwide survey distributed survey cards to 62 percent of the passengers entering during the Study.

The systemwide survey was conducted from March 26 to May 18, 1979. A series of limited supplemental surveys were conducted, including an on-board survey of selected evening trains, a survey distribution at selected stations on weekends, a survey conducted at stations serving beach areas, and a theatre survey at selected subway stations serving major evening cultural centers.

The data collected by the origin-destination surveys was organized into a useful data base for route and service planning. Computer programs were developed to produce a number of output tables from the data base. The output tables organized the Study data base into useful summaries and correlations for analysis. A full description of the output tables and samples of each are contained in Appendix A.

With the RTSSS data base assembled, existing operations and trip-making patterns were examined in order to match service levels with identified demand. The Study used the following guidelines for evaluating route and service change proposals:

- o To provide routes that reflect the current travel patterns of passengers, minimizing transfers.
- o To provide a level of service on each line that better matches the identified demand for service.
- o To simplify the route structure.
- o To maintain or improve the operating efficiency of the rapid transit system.
- o To remain within the current budget and physical plant for rapid transit operations.
- o To avoid unnecessary disruptions of present services without clearly demonstrated reason.

Disparities between existing service patterns and service demand were identified by applying information from the RTSSS data base. Once identified, route and service alternatives were developed and reviewed for advantages and disadvantages. The proposed alternatives provide the greatest benefit and the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes.

The Study presents several proposals to change train routings which will better reflect actual passenger travel patterns. The proposals deal exclusively with train routing issues and are based on data collected in 1979. They do not represent the sum total of all possible or needed improvements to the system. The following route and service changes were proposed by the Study:

- "A" - Operate the off-peak "A" local between 59 Street/Eighth Avenue and Chambers Street.
- "AA" - Replace the "AA" with the extended "B" north of 59 Street/Eighth Avenue, and with the off-peak "A" local service south of 59 Street/Eighth Avenue.
- "B" - Operate the "B" as a Sixth Avenue Express between 168 Street and Coney Island at all times (except nights).
 - Replace the "B" night shuttle to 57 Street/Sixth Avenue with the "F".

- "D" - Operate the "D" local on Sixth Avenue at nights (between 1AM and 5AM).
- "F" - Extend the hours of "F" express service in Queens until 1AM.
 - Turn the "F" at 57 Street/Sixth Avenue at nights (between 1AM and 5AM)
- "GG" - Turn the "GG" at Queens Plaza evenings (9PM weeknights, 8PM Saturdays, 7PM Sundays).
- "J" - Extended peak "J" express service to operate between Marcy Avenue and Eastern Parkway.
 - Replace off-peak "J" service with the "K".
- "K" - Operate the "K" local between 57 Street/Sixth Avenue and:
 - Rockaway Parkway (Canarsie) during peak periods.
 - Queens Blvd-Jamaica Avenue, all other times (except nights).
- "LL" - Originate or terminate some peak period trips at Atlantic Avenue.
- "M" - Extend the "M" to Broad Street during evenings and weekends (except nights).
- "N" - Operate the "N" as a Broadway Express between Astoria and Coney Island at all time ("N" night shuttle on the Sea Beach Line is no longer required).
 - All "N" trains stop at 49 Street/Seventh Avenue.
 - Replace the "N" Whitehall Specials with the "V".
- "RR" - Operate the "RR" as a Broadway Local between 71-Continental Avenues and 95 Street/Fourth Avenue, at all times.
 - Extend the "RR" to 179 Street at all times, when the "F" turns at 57 Street/Sixth Avenue.
 - Replace the "RR" Chambers Street Specials ("RJ") with the "T".
- "T" - Operates local between Chambers Street and Bay Parkway/86 Street during peak periods in the peak direction.
- "V" - Operate the "V" as a Broadway Local between Astoria and Whitehall Street during peak periods in the peak direction.

I INTRODUCTION

The New York City Transit Authority (NYCTA) provides rail rapid transit service to 3.4 million daily passengers, linking together four of the City's five boroughs. To accomplish this, the Authority operates about 595,000 revenue car-miles every weekday over 25 different routes. The physical plant consists of more than 700 track-miles, a combination of rapid transit facilities built above, below, and at grade over a 90-year period by private and public interests.

The ridership data collected by most transit properties, including the NYCTA, traditionally focuses on two objectives: measuring passenger revenues and maintaining efficient train loadings. In New York City, turnstile registrations are recorded at all rapid transit stations by the Rapid Transit Stations and Accounting Departments and are aggregated into various hourly, weekly, monthly, semi-annual, and annual reports. Information on train loadings is collected regularly by the Rapid Transit Transportation Department (RTTD) for trains entering the Manhattan Central Business District (CBD)* and at other locations as required.

These sets of data are sufficient to guide operating decisions regarding headways, car service, and station hours. Route and service planning decisions, however, require more detailed descriptions of the actual trip-making patterns of the rapid transit passengers from trip origin to trip destination.

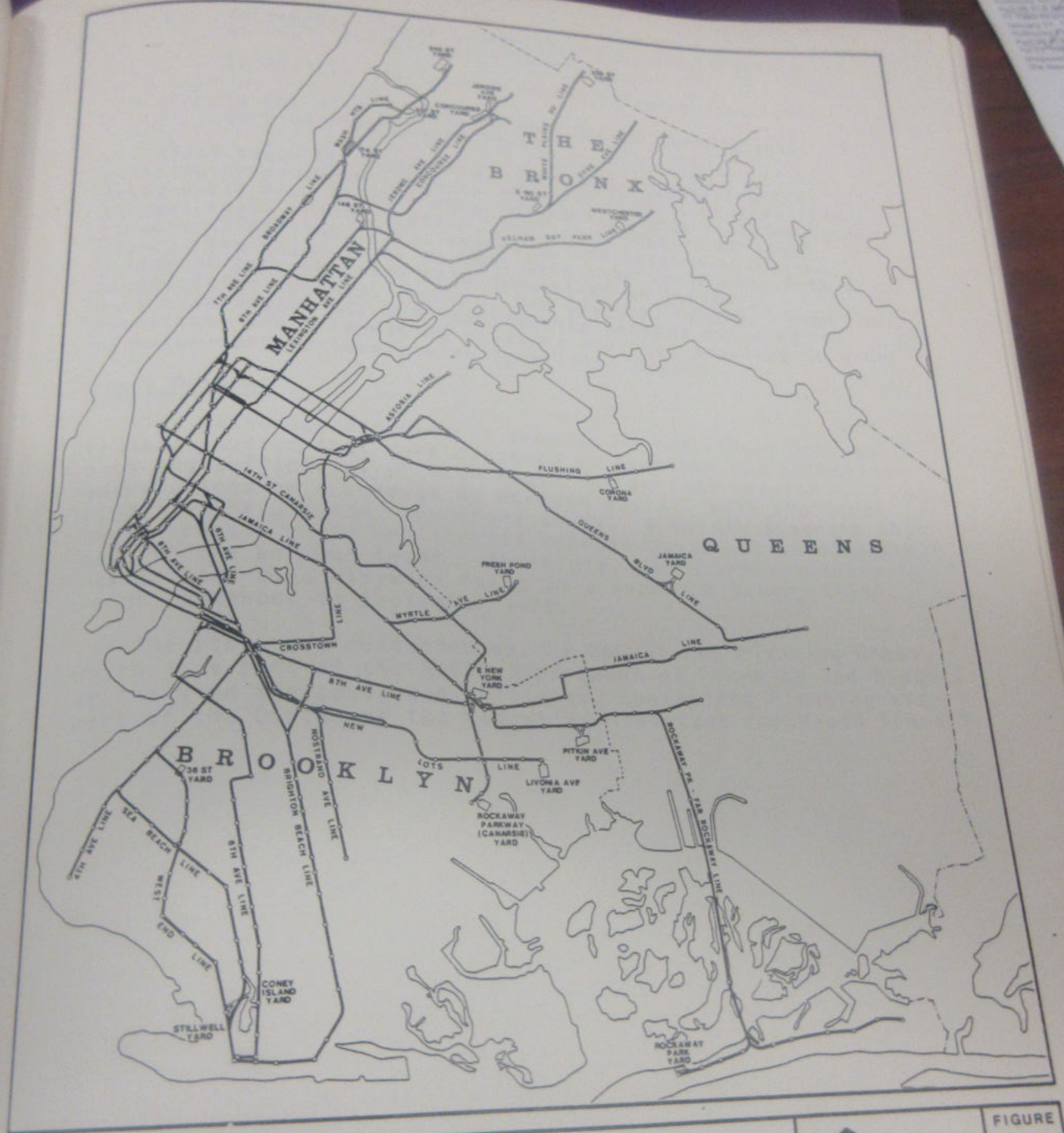
The Authority recognized the need for a reliable decision-making tool on which to base route and service changes. In September 1978, it initiated the Rapid Transit Service Sufficiency Study, the first comprehensive, systemwide origin-destination survey in the history of New York City's rapid transit system.

Study Purpose and Objectives

The purpose of Rapid Transit Service Sufficiency Study (RTSSS) is to appraise the overall effectiveness and sufficiency of rapid transit services and restructure those services in a manner more responsive to passengers travel patterns, within the limits of the Authority's current resources (that is: labor, cars, and financing). The objectives of the Study were:

- o To assemble a comprehensive data base for rapid transit route and service planning.
- o To assess and analyze the sufficiency of the existing rapid transit route structure.

* The Manhattan CBD is the area south of 59th Street between the East and Hudson Rivers. It encompasses both Midtown Manhattan and the Financial District.



NYCTA Rapid Transit Lines



FIGURE
1



New York City
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- o To improve the cost-effectiveness and attractiveness of rapid transit operations.
- o To analyze and improve access to subway stations.
- o To increase community input to the rapid transit service planning process.

RTSSS began by assembling a data base containing the existing trip-making patterns of rapid transit riders. The Study would also collect other characteristics relating to the current rapid transit system, including details of route structure, service hours, headways, and station entrance hours. The major input to this data base would come from a series of comprehensive origin-destination surveys, encompassing weekday, weekend, and seasonal travel. With the data base assembled, the relationship between existing operations and trip-making patterns would be examined in order to match service levels with identified demand.

Study Origins

The Authority undertook a program of individual borough transit studies that were designed to appraise the effectiveness and sufficiency of both rapid and surface transit operations on a borough by borough basis. With the first study in the program, the Bronx Study, it became apparent that rapid transit route and service changes could not be adequately made on the borough level. Therefore, rapid transit analysis was shifted to a citywide basis in a separate study, RTSSS, which commenced in September 1978.

The Study was conducted by the Operations Planning Group, which is a part of the NYCTA Department of Planning and Budget; at the time the study was initiated, Operations Planning was part of the Office of the Executive Assistant for Rapid Transit.

II ORIGIN-DESTINATION SURVEY

The Study required assembling a data base for rapid transit route and service planning. This would provide descriptions of the actual trip-making patterns of rapid transit passengers from trip origin to trip destination. It would involve conducting an origin-destination survey of the entire New York City rapid transit system.

Survey Design

The selection process for the survey methodology began with research of present and past practices throughout the transit industry. In addition to the transit properties, several private firms and universities with practical experience in transit origin-destination surveys were contacted, including Multisystems, Inc., Wilbur Smith and Associates, the City University of New York, Harvard University, and the Polytechnic Institute of New York. The process also included a literature search of the subject.

The survey design process considered alternative methodologies for a systemwide rapid transit survey. The study staff decided that a 24-hour survey of the entire system would not be necessary to ensure a sufficient sample size for analysis and would exceed the resources allocated to the Study. Alternative means of collecting a smaller sample were explored. These included surveying selected stations during a 24-hour period, surveying the entire system during a limited period, on board survey distributions on all trains or on selected trains, conducting passenger interviews at all stations or at selected stations, and survey distribution by token booth clerks. After analysis, some of these alternatives were rejected for the following reasons:

- o Selected Stations: This technique would not be sensitive to the broadly variable demography of New York City, where population density, composition and income levels can change dramatically from one block to another. Using some basic criteria to select stations (e.g.: passenger volumes, demographic profiles, percentage of intermodal transfers, proximity to traffic generators) would have resulted in so many selected stations that the potential savings realized through this technique would have been negated.
- o On-Platform Interviews: While there would be no postage costs and minimal printing costs, this technique would not be practical during peak periods given the crowding and noise that typify the New York City subway environment. Short peak period headways would minimize the time spent with each respondent and

additional surveyors would be required to collect platform counts in order to weight the collected samples.

- o Token Booth Distribution: This technique might have biased the sample by overrepresenting passengers that purchase tokens in small quantities. It could also impede token sales and result in passenger congestion around the booths. Token clerks, with their own sets of tasks and priorities already established, may not be able to maintain a steady distribution of survey cards and are beyond the direct supervision of the study staff. Any of these problems could carry additional, more subtle biases that would affect the validity of the sample. This technique was previously used during the Bronx Study, which encountered all of these problems.

The technique chosen for the systemwide survey was to distribute survey cards at every rapid transit station between 6AM and 2PM (except between 10AM and 11AM, when the survey team took lunch). These times were chosen after consulting turnstile registrations and represent the period when approximately 40 percent of the daily ridership enters the system (see Figure 2). This period encompasses the entire morning peak period, a portion of the midday "base" period, and the morning "shoulder" periods (the transition periods between the night and peak service, and between peak and base service).

A mail-back survey card was selected as the most practical survey instrument. Drop boxes at stations to collect survey cards were considered to minimize postage costs, but were rejected due to problems related to vandalism, the potential for littering, and the cost of fabricating boxes of sufficient size and durability. In addition, there were additional personnel costs associated with collecting the boxes and maintaining their security. By special arrangement with the Authority's Station's Department, however, the mail-back cards could also be returned to token clerks---overall, eight percent of all responses were returned via token clerks.

The survey cards were distributed to entering passengers at almost every control area in the system. The only entrances not surveyed were unstaffed control areas with passenger volumes under 100 daily passengers. There were 20 control areas that were below this criteria and the low number of potential responses would not justify distribution costs.

A detailed analysis was conducted to consider optimal sample size with minimum bias. Recent origin-destination surveys in Boston and on Staten Island distributed cards to all entering passengers (excluding children). This produced a response rate between 10 and 15 percent. Heavy passenger volumes at many New York City stations, however, would make distribution of cards to all entering passengers physically impractical and financially prohibitive.



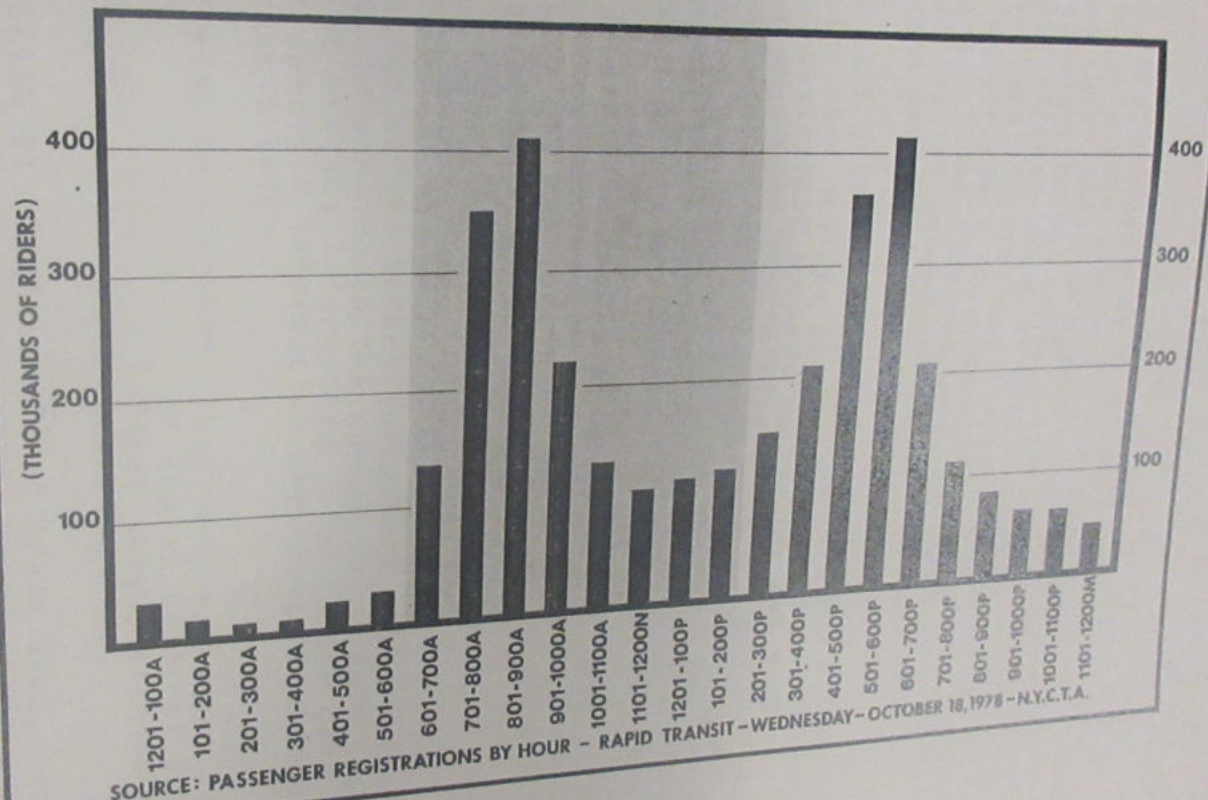
Entering Weekday Passenger Volumes By Hour

FIGURE

2



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Survey distribution to less than 100 percent of a population ideally entails drawing a random sample from the population as a whole, so that every individual has the same, quantified probability of being included in the sample. In order to achieve a truly random sample, without oversampling during any particular portion of an hour, a controlled rate of distribution (e.g.: every other passenger, every fourth passenger, etc.) would have to be maintained. However, this procedure would have required a surveyor at each turnstile with continuous supervision to ensure procedural compliance, escalating study costs. High passenger volumes would have limited the effectiveness of this procedure, disrupting passenger flows and creating the potential for conflicts between the surveyors and passengers who were not offered a survey card. These problems were confirmed by a similar origin-destination survey conducted by the Washington Metropolitan Area Transit Authority.

Since both a 100 percent distribution and a controlled-rate distribution were neither practical nor cost-effective, it was decided to distribute surveys to the maximum number of passengers possible. A similar technique was used during recent origin-destination surveys by both the Chicago Transit Authority and the Port Authority of New York and New Jersey. In retrospect, the systemwide survey distributed survey cards to 62 percent of the passengers entering during the Study.

Hourly turnstile registrations were recorded at every station entrance during survey card distribution in order to eventually weight the sample to describe the behavior of all entering passengers during a particular hour.

Survey-Card-Design

The design of the survey instrument was critical since ambiguities in wording on the survey card could result in distorted or useless information. The survey card was designed to collect specific information regarding the respondent's current transit trip:

BEFORE ENTERING THE SUBWAY: Trip origin, reason for trip, mode of travel to first subway station, first subway station used, entering time.

WHILE TRAVELING BY SUBWAY: First train used, second train used, third train used, all transfer stations, type of fare paid.

AFTER LEAVING THE SUBWAY: Trip destination, reason for trip, mode of travel from the station, last station used.

A preliminary survey card was developed (Figure 3) after a review of sample survey cards used by other transit properties and relying on the experience of the study staff with other origin-destination surveys. For example, the problems with a limited survey previously conducted at Grand Central Station included respondents tending to describe a full round-trip when actually asked to describe a one-way trip, or respondents indicating their next transfer station when actually asked to describe their destination. In response to this experience, the preliminary survey card stressed the fact that information was being collected about the one-way trip the respondent was making now. The questions were ordered in a logical sequence to describe a single one-way trip from start to finish, minimizing confusion.

Another possible source of ambiguity related to the mode of access questions. Walking is a natural and significant part of every trip in New York City, regardless of mode. The choice of "walking" was phrased "walking only" to differentiate walking as the predominate mode of access from other modes of access which may involve some walking en route to the station. For example, a passenger receiving a survey card at Whitehall Street-South Ferry Station may have just left the Staten Island Ferry. Transferring from the ferry to the subway involves a two-block walk, so the respondent might indicate "walking" as his mode of access with his origin in Staten Island, thereby describing an improbable walk across five miles of water to reach the subway.

All survey cards were sequentially numbered to facilitate recording distribution volumes and to help the sorting process later. Further, the serial numbers identified the actual station and time that each card was distributed. By cross-referencing the actual station and time with that indicated by the respondent, the computer could edit out "found cards"---cards that were discarded by passengers and filled out by others.

The survey card did not provide a designated space for passenger comments as coding these comments would not be relevant to the trip-oriented data base designed for the Study. Nevertheless, many respondents tried to fit comments on the card, sometimes in the margins and sometimes over the questions themselves. As a result, many of these cards had to be edited out as unreadable. To avoid this problem in subsequent surveys, Operations Planning now provides some space on all survey cards for passengers to write their comments and opinions.

Pilot-Survey

A pilot survey was conducted to field test the preliminary survey card wording and layout, as well as to test the practicality of the distribution procedures. Five transit stations were selected for this test to represent the neighborhoods and station access patterns that the study staff expected to encounter during the systemwide survey.



Pilot Survey Card

FIGURE

3



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WE WANT TO MAKE YOUR TRIP EASIER AND FASTER.

To help us do this, please complete the statement below about the trip you are making now. Then, bring it to any tax & booth or drop it in any U.S. mail box (no stamp required).
Thank you for your assistance.

1. I RECEIVED THIS CARD AT _____ STATION AT _____ O'CLOCK, WHERE I TAKE _____ TRAIN.

2A. THE PLACE I CARE FROM BEFORE I ARRIVED AT THIS STATION IS: (✓ CHECK ONE)
☐ 1. HOME
☐ 2. WORK
☐ 3. BUSINESS APPOINTMENT OR DELIVERY
☐ 4. SCHOOL
☐ 5. RECREATION/SOCIAL/CULTURAL
☐ 6. MEDICAL VISIT
☐ 7. SHOPPING
☐ 8. OTHER _____

2B. WHICH IS LOCATED AT: _____

3. TO GET TO THIS STATION FROM THE ABOVE PLACE, I ARRIVED BY: (✓ CHECK ONE)
☐ 1. WALKING ONLY
☐ 2. BUS _____ (LETTER OR NUMBER)
☐ 3. AUTO
☐ 4. RAILROAD _____ (LETTER)
☐ 5. TAXI/CAR SERVICES
☐ 6. FERRY
☐ 7. OTHER _____ (SPECIFY)

ANSWER THIS SECTION ONLY IF YOU ARE TRANSFERRING TO OTHER TRAINS ON THIS TRIP

4A. I WILL TRANSFER TO THE _____ TRAIN AT _____ STATION.

4B. (ANSWER ONLY IF SECOND TRANSFER IS MADE)
I WILL AGAIN TRANSFER TO THE _____ TRAIN AT _____ STATION.

4C. (ANSWER ONLY IF THIRD TRANSFER IS MADE)
I WILL AGAIN TRANSFER TO THE _____ TRAIN AT _____ STATION.

5. I WILL LEAVE THE SYSTEM AT THE _____ STATION
AFTER GETTING OFF THE _____ TRAIN.

6A. WHEN I LEAVE THE SUBWAY, I WILL GO TO: (✓ CHECK ONE)
☐ 1. HOME
☐ 2. WORK
☐ 3. BUSINESS APPOINTMENT OR DELIVERY
☐ 4. SCHOOL
☐ 5. RECREATION/SOCIAL/CULTURAL
☐ 6. MEDICAL VISIT
☐ 7. SHOPPING
☐ 8. OTHER _____ (SPECIFY)

6B. WHICH IS LOCATED AT: _____

7. I WILL GET THERE FROM THE SUBWAY BY: (✓ CHECK ONE)
☐ 1. WALKING ONLY
☐ 2. BUS _____ (LETTER OR NUMBER)
☐ 3. AUTO
☐ 4. RAILROAD _____ (LETTER)
☐ 5. TAXI/CAR SERVICES
☐ 6. FERRY
☐ 7. OTHER _____ (SPECIFY)

8. I PAID THE FOLLOWING SUBWAY FARE: (✓ CHECK ONE)
☐ 1. REGULAR 50¢ FARE
☐ 2. SENIOR CITIZEN 1/2 FARE
☐ 3. HANDICAPPED 1/2 FARE
☐ 4. WEEKEND 1/2 FARE
☐ 5. SCHOOL FARE
☐ 6. FREE TRANSFER FROM BUS
☐ 7. OTHER _____ (SPECIFY)



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NYCTA-87

Northern Boulevard Station, Queens Boulevard Line:
A mixed-income community with a high percentage of transfers from feeder bus services (all non-Authority routes).

Prospect Avenue Station, White Plains Road Line:
A low-income, predominately Hispanic community in the South Bronx.

Kingston-Throop Avenues Station, Fulton Street Line:
A low-income, predominately black community in Central Brooklyn.

Flatbush Avenue Station, IRT Brooklyn Line:
A middle-income community with high passenger volumes and a large number of transfers from feeder bus services (provided by the Authority and other operators), creating unbalanced and irregular passenger volumes.

Whitehall Street-South Ferry Station, Broadway Line:
In the financial district, with a high percentage of riders transferring from the Staten Island Ferry. High passenger volumes during rush hours and subject to a "mini-peak" at lunchtime from surrounding office buildings.

The test survey was conducted between 6AM and 2PM, the hours planned for the systemwide survey.

The distribution rate (the percentage of entering passengers that accepted survey cards) at the five test stations averaged 89 percent, and the valid response rate (the percentage of entering passengers that returned valid survey cards) averaged 24.2 percent. The hourly distribution rates at Northern Boulevard and Whitehall Street-South Ferry Stations remained reasonably constant, while the rates at the other stations were lower during the peak period for traffic towards Manhattan. This was the result of high passenger volumes making distribution to each entering passenger more difficult.

The pilot survey confirmed that the distribution procedure was practical and that the preliminary survey card was understandable. However, some improvements to the card were indicated:

- o "PATH" was added as a specific response to the access mode questions. Many New Jersey riders use commuter rail services to Newark and Hoboken, then transfer to PATH prior to entering the subway. Some of these riders indicated PATH as their first subway line used, while others indicated "RAILROAD" where no commuter trains provide a direct connection (e.g.: at the World Trade Center). A specific "PATH" choice helped respondents to differentiate between modes.
- o The word "SUBWAY" was added before "TRAINS" in Question #4 to clarify the definition of transfer.

- o The word "SUBWAY" was substituted for "SYSTEM" in Question #5, as a more colloquial term for rapid transit service.
- o Question #5 was changed to read: "AT THE END OF THIS TRIP, I WILL LEAVE THE SUBWAY AT STATION" to clarify the end of the subway trip.

The final survey card is presented in Figure 4.

Survey Administration

1. Systemwide Survey

The systemwide survey was conducted from March 26 to May 18, 1979, except for two weeks starting on April 9th to avoid surveying during the observances of Easter and Passover. Surveyors reported to assigned control areas every weekday morning prior to 6AM. They went to the token booth and retrieved their daily supply of survey cards and two large signs. These signs, emblazoned with the Transit Authority logo, announced the survey to incoming passengers (one sign in English, the other sign in Spanish)---in retrospect, the signs assisted public acceptance of survey cards. Surveyors also wore identification badges emblazoned with the TA logo.

Public acceptance of the survey was also aided by the Authority's Public Affairs Department, which designed a special car poster announcing the survey (Figure 5). These posters were displayed in every subway car and posted in control areas about a week before it was surveyed. Press releases also were issued and letters were sent to local officials, community boards, and civic groups, urging public participation in the Study. The survey distribution also received television and radio coverage. These efforts ensured public familiarity with the survey and had a positive effect on the overall distribution and response rates.

The limited size of the survey card did not permit bilingual wording and a separate Spanish-language survey card would have required maintaining a second set of serial numbers to be weighted separately---an unwieldy process for the surveyors. Therefore, a separate Spanish translation sheet was provided to passengers upon request. The translation was provided on a letter-sized sheet of paper with questions keyed to answers blanks on the English-language survey card. The sheet specifically instructed respondents to fill out the survey card, not the translation sheet.

Each surveyor was responsible for recording specific information on a Survey Report Sheet (Figure 6). Every hour beginning at 6AM, the surveyor entered the number of the top survey card and readings from passenger counters in each turnstile. This provided the necessary information for computer editing of "found cards" and weighting of the sample response.



Final Survey Card

FIGURE

4



New York City
Transit
Authority

WE WANT TO MAKE YOUR TRIP EASIER AND FASTER.

To help us do this, please complete the statements below about the trip you are making 0226. Then, bring it to any token booth or drop it in any U.S. mail box (no stamp required).

Thank you for your assistance.

1. I RECEIVED THIS CARD AT _____ STATION AT _____
(NAME OF STATION) O'CLOCK, WHERE I TOOK _____ TRAIN
(LETTER OR NUMBER)

2A. THE PLACE I CAME FROM BEFORE I ARRIVED AT THIS STATION IS: (IF CHECK ONE)
☐ 1. HOME ☐ 5. RECREATION/SOCIAL/CULTURAL
☐ 2. WORK ☐ 6. MEDICAL VISIT
☐ 3. BUSINESS APPOINTMENT OR DELIVERY ☐ 7. SHOPPING
☐ 4. SCHOOL ☐ 8. OTHER (SPECIFY) _____

2B. WHICH IS LOCATED AT _____

STREET ADDRESS, INTERSECTION, OR BUILDING NAME (FOR EXAMPLE, EMPIRE STATE BUILDING)

3. TO GET TO THIS STATION FROM THE ABOVE PLACE, I ARRIVED BY: (IF CHECK ONE)
☐ 1. WALKING ONLY ☐ 5. TAXI/CAR SERVICE
☐ 2. BUS (ROUTE NUMBER OR LINE) ☐ 6. FERRY
☐ 3. AUTO ☐ 7. PATH
☐ 4. RAILROAD (LINE) ☐ 8. OTHER (SPECIFY) _____

ANSWER THIS SECTION ONLY IF YOU ARE TRANSFERRING TO OTHER SUBWAY TRAINS ON THIS TRIP

4A. I WILL TRANSFER TO THE _____ TRAIN AT _____
(LETTER OR NUMBER) (NAME OF STATION)

4B. (ANSWER ONLY IF SECOND TRANSFER IS MADE)

I WILL AGAIN TRANSFER TO THE _____ TRAIN AT _____
(LETTER OR NUMBER) (NAME OF STATION)

4C. (ANSWER ONLY IF THIRD TRANSFER IS MADE)

I WILL AGAIN TRANSFER TO THE _____ TRAIN AT _____
(LETTER OR NUMBER) (NAME OF STATION)

5. AT THE END OF THIS TRIP, I WILL LEAVE THE SUBWAY AT THE _____ (NAME OF STATION)
STATION AFTER GETTING OFF THE _____ TRAIN
(LETTER OR NUMBER)

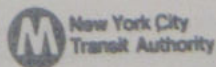
6A. WHEN I LEAVE THE SUBWAY, I WILL GO TO: (IF CHECK ONE)
☐ 1. HOME ☐ 5. RECREATION/SOCIAL/CULTURAL
☐ 2. WORK ☐ 6. MEDICAL VISIT
☐ 3. BUSINESS APPOINTMENT OR DELIVERY ☐ 7. SHOPPING
☐ 4. SCHOOL ☐ 8. OTHER (SPECIFY) _____

6B. WHICH IS LOCATED AT _____

STREET ADDRESS, INTERSECTION, OR BUILDING NAME (FOR EXAMPLE, EMPIRE STATE BUILDING)

7. I WILL GET THERE FROM THE SUBWAY BY: (IF CHECK ONE)
☐ 1. WALKING ONLY ☐ 5. TAXI/CAR SERVICE
☐ 2. BUS (ROUTE NUMBER OR LINE) ☐ 6. FERRY
☐ 3. AUTO ☐ 7. PATH
☐ 4. RAILROAD (LINE) ☐ 8. OTHER (SPECIFY) _____

8. I PAID THE FOLLOWING SUBWAY FARE: (IF CHECK ONE)
☐ 1. REGULAR 50¢ FARE ☐ 5. SCHOOL FARE
☐ 2. SENIOR CITIZEN 1/2 FARE ☐ 6. FREE TRANSFER FROM BUS
☐ 3. HANDICAPPED 1/2 FARE ☐ 7. OTHER (SPECIFY) _____
☐ 4. WEEKEND 1/2 FARE



4894340



**Survey
Announcement
Sign**

FIGURE

5



New York City
Transit
Authority

Help to make your trip easier and faster

The Transit Authority is doing a major travel survey to help us plan services better suited to your needs.

Travel survey cards will be distributed at your station. Please fill out the card after you have completed your trip. Turn the card into any token booth clerk, or drop it in the mail (no postage is needed).

Thank you for your cooperation.



New York City
Transit
Authority



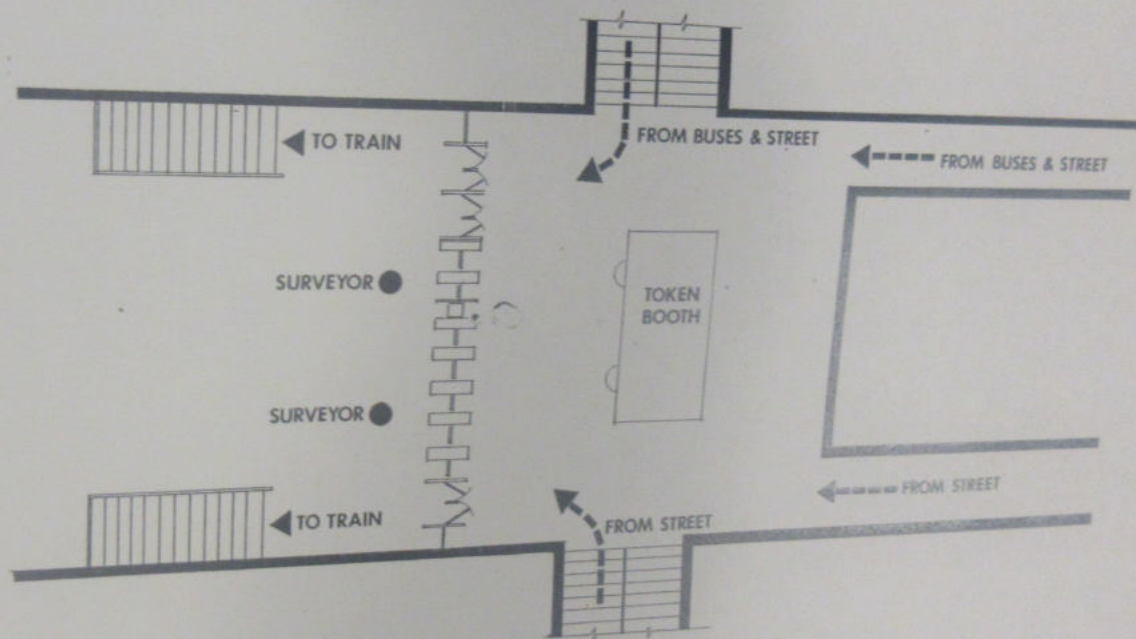
Directional Bias At Stations

FIGURE

7



New York City
Transit
Authority



One survey card was handed to every entering passenger. This basic instruction had to be constantly reinforced as many passengers insisted on an additional survey card for friends and relatives who had missed the survey. Surveyors were instructed to position themselves inside the fare-paid zone of the control area just beyond the turnstiles. This was demonstrated to be the most efficient way of distributing cards to entering passengers. Passengers passing through the turnstiles, having just deposited a token, had an available hand with which to accept a survey card.

Surveyors generally worked alone, but additional surveyors were assigned to control areas with sets of five turnstiles or more, if warranted by passenger volumes during peak periods. Additional staff were also assigned if passenger access to the turnstiles entered from different directions (e.g.: see Figure 7). In situations such as this, a directional bias could be introduced if the survey cards were not evenly distributed across the entire set of turnstiles.

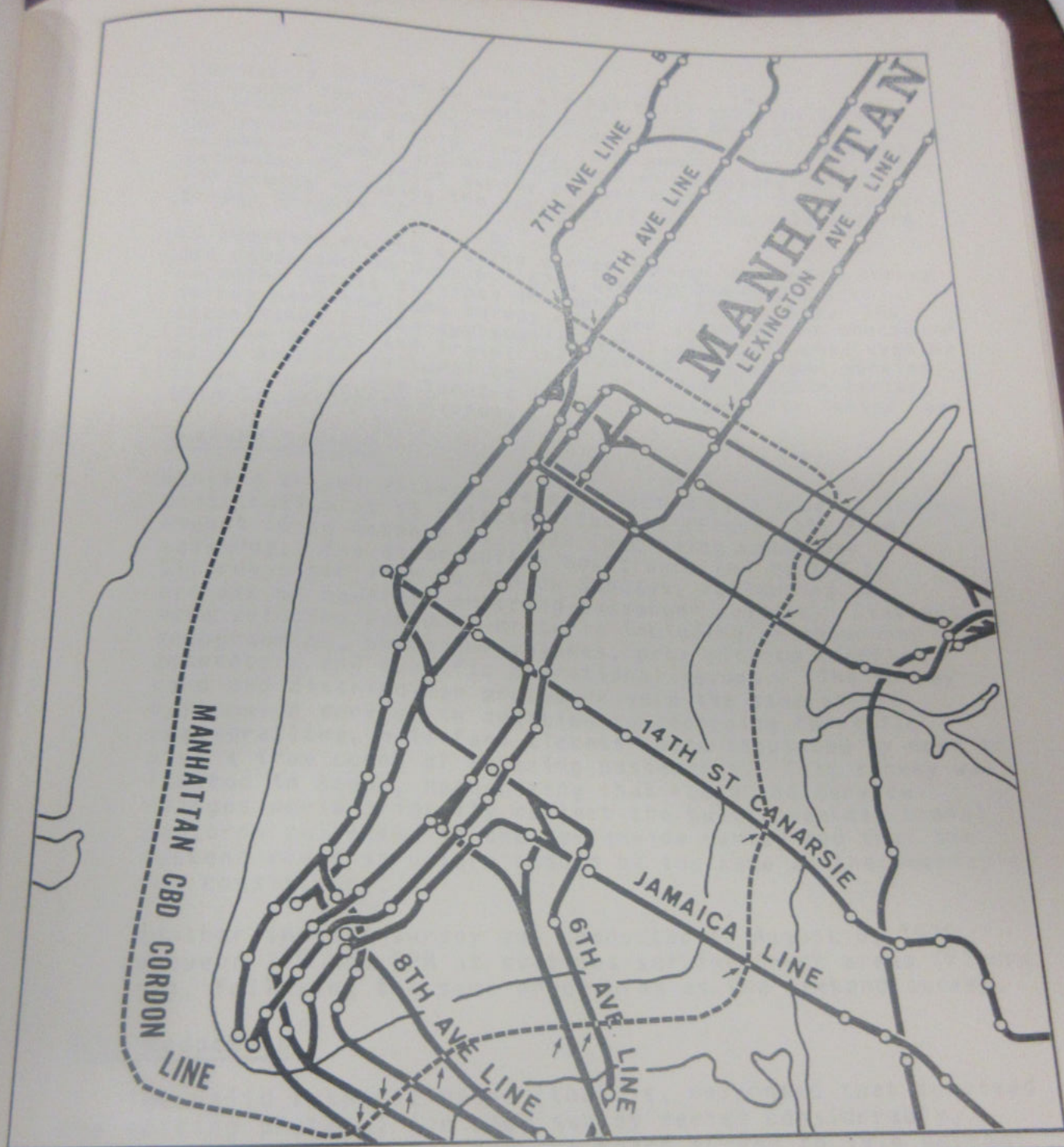
Based on the experience of other properties, field supervision received special attention. The success of the distribution operation is directly creditable to the level of supervision provided by the study staff, which remained in the field during the entire survey period. The study staff provided general oversight duties and productivity checks. They distributed additional survey materials and resolved problems that arose. Most importantly, the study staff had the technical expertise to detect and correct record-keeping errors in the field, minimizing eventual errors in the Study's data base.

2. Supplemental Surveys

In order to broaden the Study data base to include evening and weekend travel patterns, a series of limited surveys were conducted after the systemwide survey was complete.

Evening (Cordon & Theatre) Surveys

An on-board survey of selected trains was conducted between 8PM and 1AM from September 24 to October 11, 1979; these dates were chosen to include school and college ridership. Study staff were assigned to distribute survey cards to each car on selected trains crossing the cordon line surrounding the Manhattan Central Business District (CBD); these locations are shown in Figure 8. This distribution technique was chosen because a station survey, as in the systemwide survey, would not have been cost-effective in the evening because of the relatively low entering passenger volumes. The methodology assumed that most evening trips on the subway are either in or out of the Manhattan CBD, therefore the most economical spot to survey the greatest number of evening riders would be as they crossed the cordon line.



Evening Survey Locations (Manhattan CBD Cordon Line)



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Transit
Authority

FIGURE

8

The survey instrument used was basically the same survey card used for the systemwide survey, but the card was modified to reorder the questions into a logical sequence for describing a trip already in progress (Figure 9). The on-board survey card and distribution procedure were validated in a pilot survey conducted on July 24, 1979, on "J" trains crossing the cordon line over the Williamsburg Bridge (Figure 10).

In addition to the evening cordon survey, a theatre survey was conducted on June 6, 1979, between 8PM and 1AM at selected subway stations in Manhattan (Figure 11). The survey used the same survey card and distribution procedure established by the systemwide survey, but collected evening station access and travel information at stations serving major evening cultural centers, including Lincoln Center, Times Square, the Theatre District, Rockefeller Center, and 59th Street/Third Avenue.

Weekend Surveys

Weekend travel patterns were collected by a special survey distribution at 59 selected stations (Figure 12) from August 18 to October 21, 1979 (excluding Labor Day weekend). The distribution hours were 7AM to 3PM on Saturdays and 11AM to 6PM on Sundays, reflecting the periods of heaviest entering passenger volumes. Stations were selected based on criteria including neighborhood demographics, passenger volumes, proximity to traffic generators and specific operational issues. The survey card and distribution procedure were the same as the systemwide survey; in addition to recording turnstile registrations, half-fare tickets* were tabulated by hour to give a true count of entering passengers. This survey was limited in scope, recognizing that route and service changes would primarily reflect the busier weekday travel patterns collected in the systemwide survey and that the weekend route structure should be the same as the weekday's for consistency.

Another special survey was conducted on August 5, 1979, between 3PM and 8PM at stations serving beach areas (Figure 13), following the same procedures as the weekend survey.

Data Reduction

The valid response rates (that is, responses that survived the editing process) for each survey varied considerably, ranging from 3.8 percent for the beach survey to 19.4 percent for the systemwide survey. The response rates for the individual surveys on Table 1.

* The half-fare ticket program is no longer a part of the Authority's fare structure.

**WE WANT TO MAKE YOUR TRIP
EASIER AND FASTER.**

To help us do this, please complete the statements below about the trip you are making **evening**. Then, bring it to any token booth or drop it in any U.S. mail box (no stamp required).

Thank you for your assistance.

1. I RECEIVED THIS CARD ON THE _____ TRAIN AT _____ O'CLOCK.
(LETTER OR NUMBER)

2. AT THE START OF THIS TRIP, I ENTERED THE SUBWAY AT _____
STATION WHERE I BOARDED THE _____ TRAIN.
(NAME OF STATION) (LETTER OR NUMBER)

3A. THE PLACE I CAME FROM BEFORE I ARRIVED AT THE SUBWAY STATION WAS: (✓ CHECK ONE)

- | | |
|--|--|
| <input type="checkbox"/> 1. HOME | <input type="checkbox"/> 5. RECREATIONAL/SOCIAL/CULTURAL |
| <input type="checkbox"/> 2. WORK | <input type="checkbox"/> 6. MEDICAL VISIT |
| <input type="checkbox"/> 3. BUSINESS APPOINTMENT OR DELIVERY | <input type="checkbox"/> 7. SHOPPING |
| <input type="checkbox"/> 4. SCHOOL | <input type="checkbox"/> 8. OTHER (SPECIFY) _____ |

3B. WHICH IS LOCATED AT:

STREET ADDRESS, INTERSECTION, OR BUILDING NAME (FOR EXAMPLE: EMPIRE STATE BUILDING)

4. TO GET TO THE SUBWAY STATION FROM THE ABOVE PLACE, I ARRIVED BY: (✓ CHECK ONE)

- | | |
|---|---|
| <input type="checkbox"/> 1. WALKING ONLY | <input type="checkbox"/> 5. TAXI/CAR SERVICE |
| <input type="checkbox"/> 2. BUS (GIVE NUMBER OR TYPE) | <input type="checkbox"/> 6. FERRY |
| <input type="checkbox"/> 3. AUTO | <input type="checkbox"/> 7. PATH |
| <input type="checkbox"/> 4. RAILROAD (TYPE) | <input type="checkbox"/> 8. OTHER (SPECIFY) _____ |

ANSWER THIS SECTION ONLY IF YOU TRANSFER TO OTHER SUBWAY TRAINS ON THIS TRIP

5A. I TRANSFER TO THE _____ TRAIN AT _____
STATION. (LETTER OR NUMBER) (NAME OF STATION)

5B. (ANSWER ONLY IF A SECOND TRANSFER IS MADE)

I THEN TRANSFER TO THE _____ TRAIN AT _____
STATION. (LETTER OR NUMBER) (NAME OF STATION)

5C. (ANSWER ONLY IF A THIRD TRANSFER IS MADE)

I THEN TRANSFER TO THE _____ TRAIN AT _____
STATION. (LETTER OR NUMBER) (NAME OF STATION)

6. AT THE END OF THIS TRIP, I WILL LEAVE THE SUBWAY AT THE _____
STATION AFTER GETTING OFF THE _____ TRAIN.
(NAME OF STATION) (LETTER OR NUMBER)

7A. WHEN I LEAVE THE SUBWAY, I WILL GO TO: (✓ CHECK ONE)

- | | |
|--|--|
| <input type="checkbox"/> 1. HOME | <input type="checkbox"/> 5. RECREATIONAL/SOCIAL/CULTURAL |
| <input type="checkbox"/> 2. WORK | <input type="checkbox"/> 6. MEDICAL VISIT |
| <input type="checkbox"/> 3. BUSINESS APPOINTMENT OR DELIVERY | <input type="checkbox"/> 7. SHOPPING |
| <input type="checkbox"/> 4. SCHOOL | <input type="checkbox"/> 8. OTHER (SPECIFY) _____ |

7B. WHICH IS LOCATED AT:

STREET ADDRESS, INTERSECTION, OR BUILDING NAME (FOR EXAMPLE: EMPIRE STATE BUILDING)

8. I WILL GET THERE FROM THE SUBWAY BY: (✓ CHECK ONE)

- | | |
|---|---|
| <input type="checkbox"/> 1. WALKING ONLY | <input type="checkbox"/> 5. TAXI/CAR SERVICE |
| <input type="checkbox"/> 2. BUS (GIVE NUMBER OR TYPE) | <input type="checkbox"/> 6. FERRY |
| <input type="checkbox"/> 3. AUTO | <input type="checkbox"/> 7. PATH |
| <input type="checkbox"/> 4. RAILROAD (TYPE) | <input type="checkbox"/> 8. OTHER (SPECIFY) _____ |



New York City
Transit Authority

0035216

RAPID TRANSIT



SERVICE SUFFICIENCY STUDY

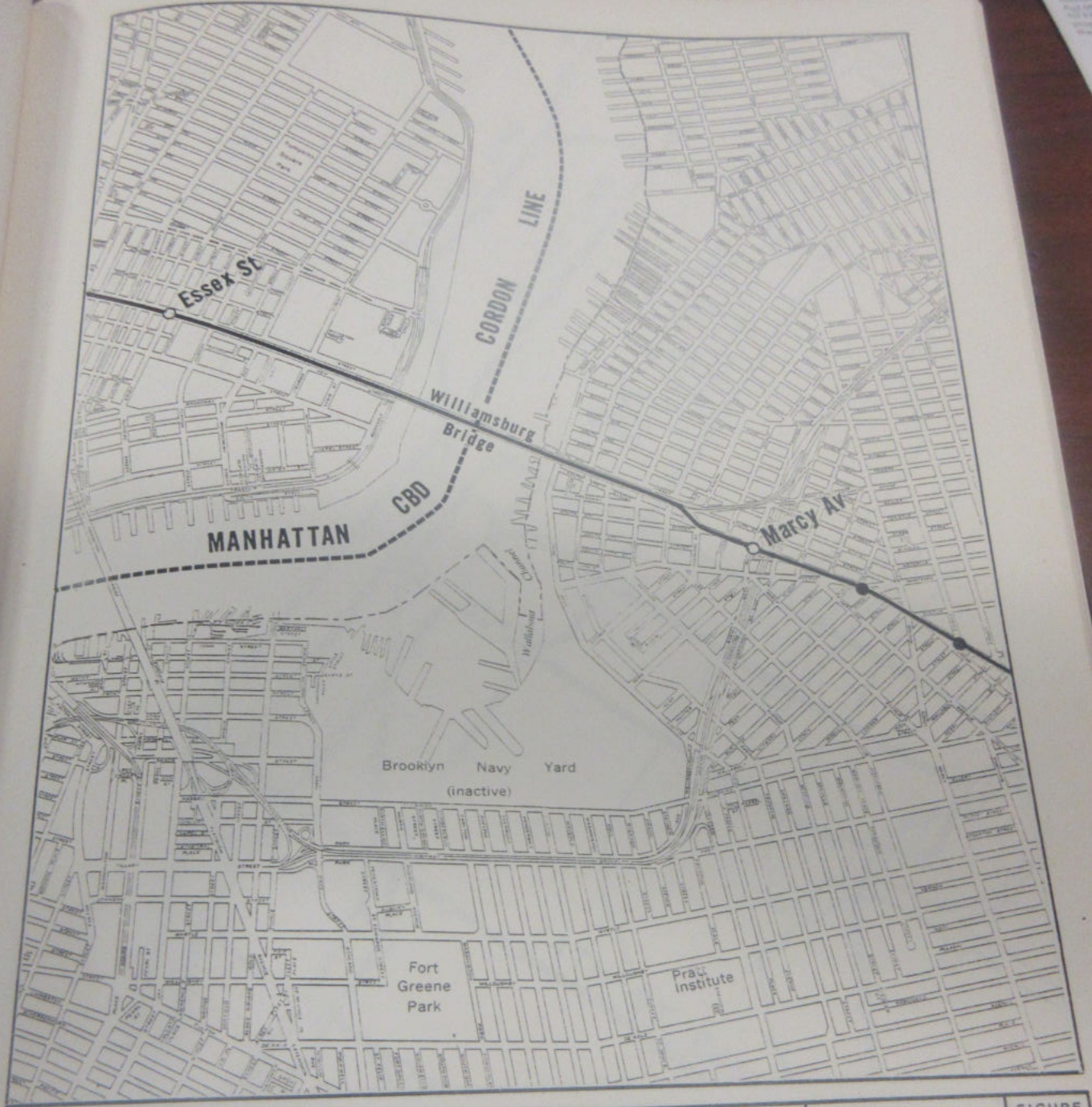
Evening Survey Card

FIGURE

9



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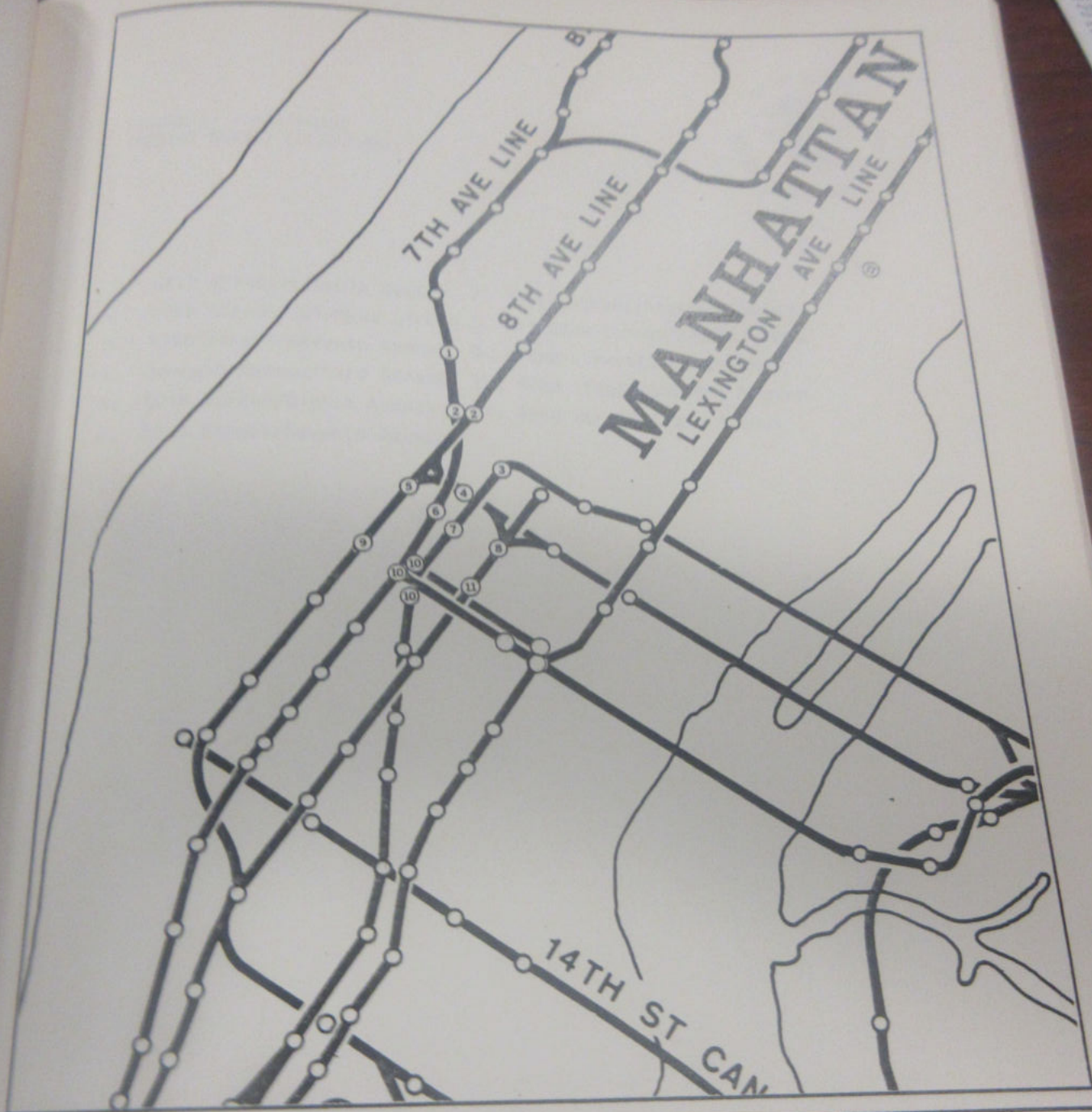
Pilot Evening Survey



FIGURE
10



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Theatre Survey Locations



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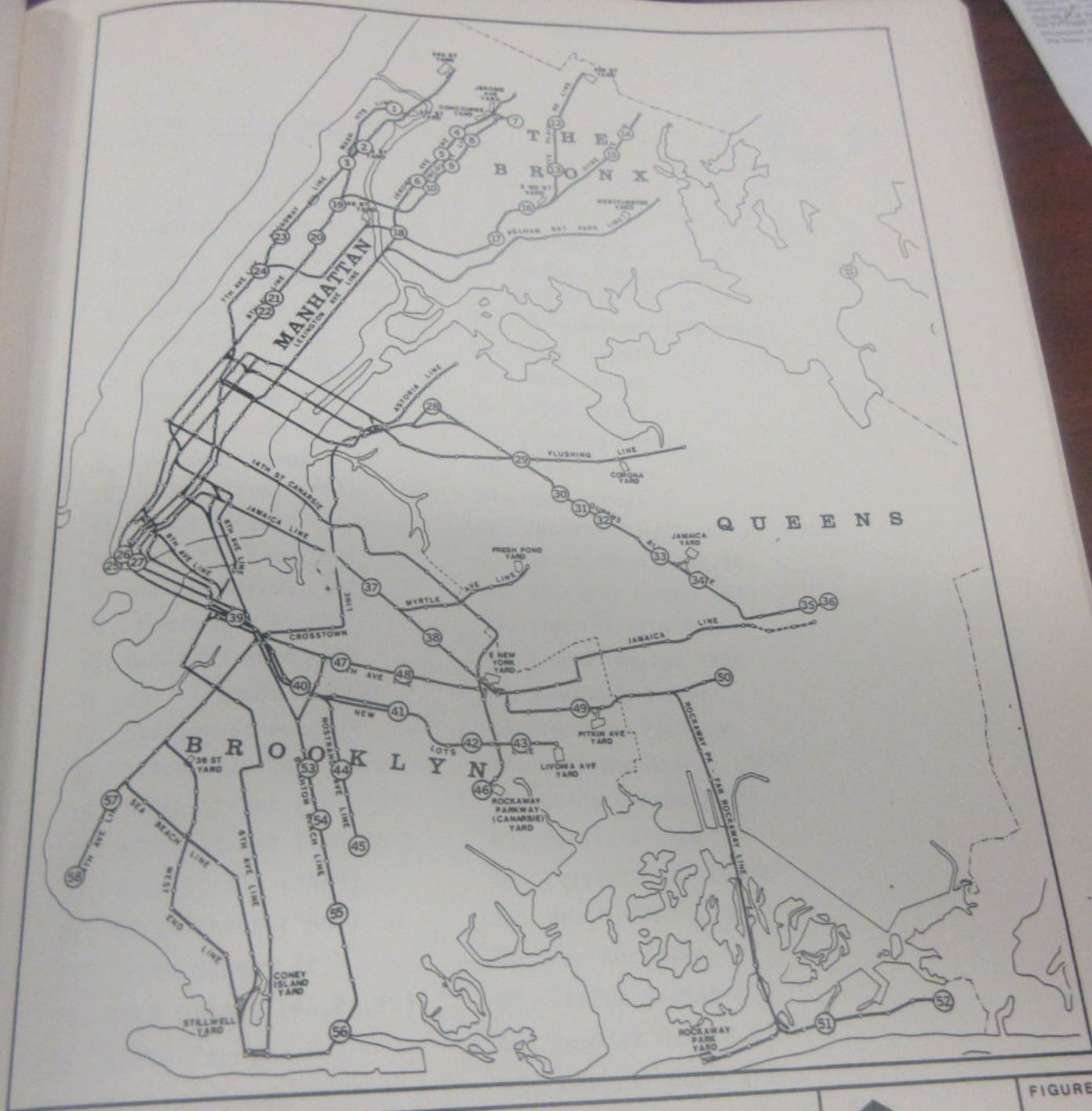
FIGURE

11

FIGURE 11 (continued)
THEATRE SURVEY LOCATIONS



1. 66th Street-Lincoln Center
2. 59th Street-Columbus Circle
3. 57th Street-Seventh Avenue
4. Seventh Avenue/53rd Street
5. 50th Street/Eighth Avenue
6. 50th Street-Seventh Avenue
7. 49th Street-Seventh Avenue
8. 47-50th Street/Sixth Avenue
9. 42nd Street/Eighth Avenue
10. 42nd Street-Seventh Avenue
11. 42nd Street/Sixth Avenue



FIGURE

12



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Weekend Survey Locations



RAPID TRANSIT

THE SUFFICIENCY STUDY

FIGURE 12 (continued)
WEEKEND SURVEY LOCATIONS



1. 207th Street/Broadway
2. 181st Street/Broadway
3. 168th Street/Broadway
4. Fordham Road (#4)
5. Burnside Avenue
6. 170th Street (#4)
7. 205th Street
8. Fordham Road ("D")
9. Tremont Avenue
10. 170th Street ("D")
11. 241st Street
12. Gun Hill Road (#2)
13. Pelham Parkway (#2)
14. Baychester Road
15. Gun Hill Road (#5)
16. East Tremont Avenue
17. Simpson Street
18. 149th St/Grand Concourse
19. 145th Street ("A", "D")
20. 125th Street ("A", "D")
21. 86th Street ("AA")
22. 81st Street ("AA")
23. 125th Street (#1)
24. 96th Street (#1, #2, #3)
25. South Ferry
26. Bowling Green
27. Whitehall Street
28. Steinway Street
29. Roosevelt Av-Jackson Hts
30. Grand Avenue
31. Woodhaven Boulevard
32. 63rd Drive
33. 71st-Continental Avenues
34. Union Turnpike
35. 169th Street
36. 179th Street
37. Flushing Avenue
38. Gates Avenue
39. Hoyt Street
40. Eastern Pkwy/Brooklyn Museum
41. Utica Avenue (#2, #4)
42. Rockaway Avenue (#2)
43. Pennsylvania Avenue
44. Church Avenue (#3)
45. Flatbush Avenue
46. Rockaway Parkway
47. Nostrand Avenue ("A")
48. Utica Avenue ("A")
49. Euclid Avenue
50. Lefferts Boulevard
51. Beach 60th Street
52. Far Rockaway
53. Church Avenue ("D")
54. Newkirk Avenue ("D")
55. Kings Highway ("D")
56. Sheepshead Bay ("D")
57. Bay Ridge Avenue
58. 95th Street/Fourth Avenue



Beach Survey Locations

FIGURE 13



New York City
Transit
Authority

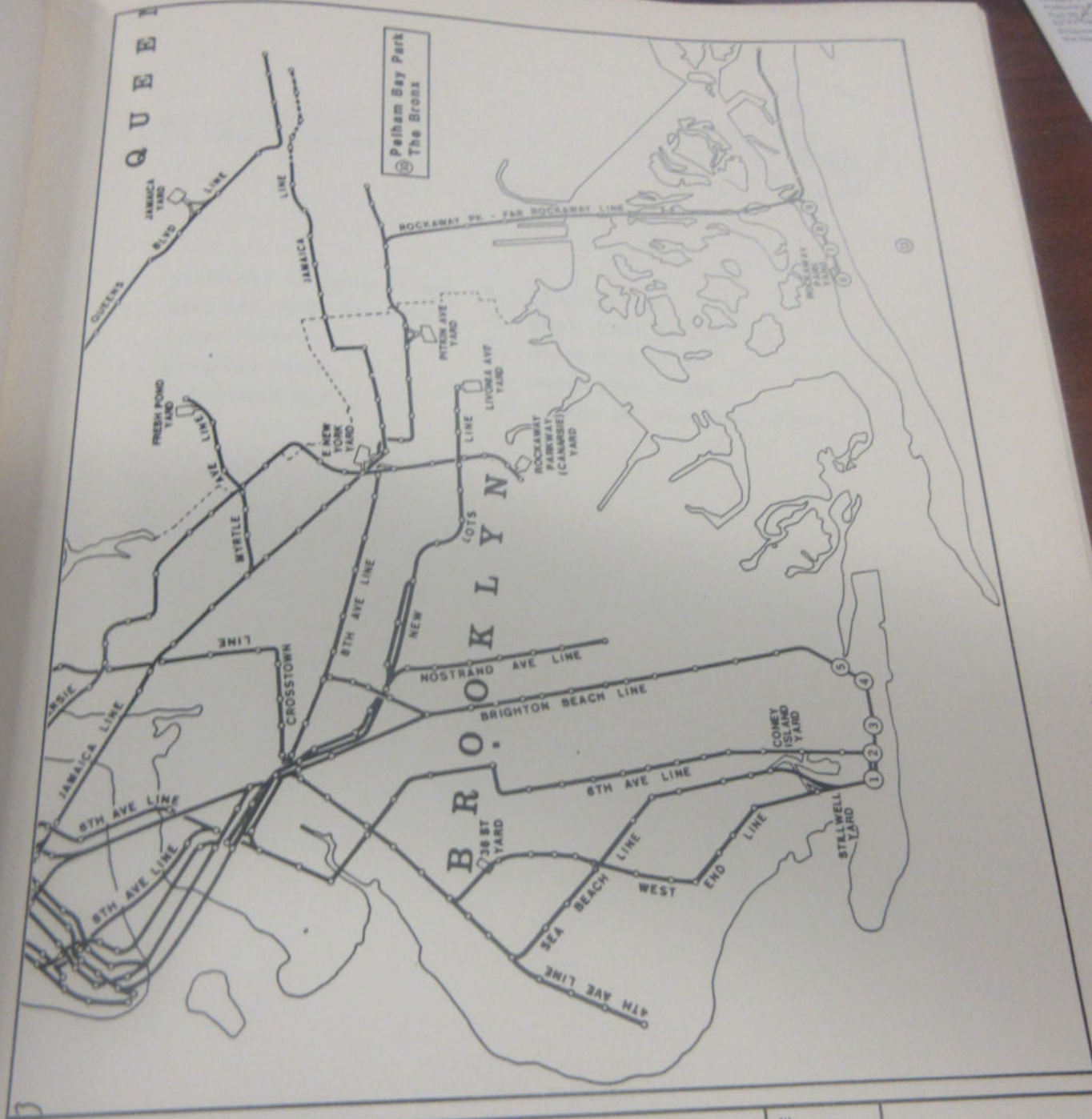


FIGURE 13 (continued)
BEACH SURVEY LOCATIONS



③

- | | |
|------------------------------|----------------------------------|
| 1. Stillwell Av-Coney Island | 6. Rockaway Park |
| 2. West 8th St-NY Aquarium | 7. Beach 105th Street |
| 3. Ocean Parkway | 8. Beach 98th Street |
| 4. Brighton Beach | 9. Beach 90th Street |
| 5. Sheepshead Bay | 10. Pelham Bay Park (not on map) |

TABLE 1 SURVEY VALID RESPONSE RATES				
SURVEY	ENTERING PASSENGERS	CARDS DISTRIBUTED	VALID CARDS TOTAL	RETURNED PERCENT
System-wide	1,633,591	928,815	180,417	19.4%
Evening Cordon	---	30,330	4,704	15.5%
Evening Theatre	39,689	26,420	2,911	11.0%
Weekend	249,392	150,258	13,944	9.3%
Beach	94,379	24,919	943	3.8%

Analysis Zones

To organize the data collected by the origin-destination surveys into a useful data base of route and service planning, a set of analysis zones was developed for the New York City metropolitan area. The criteria for these zones included the location of major traffic generators, the alignment of existing travel corridors and neighborhood characteristics, as well as compatibility with the zones used by other transportation planning data bases in the New York City area.

A variety of existing zone systems were considered as a basis for the RTSSS analysis zones, including:

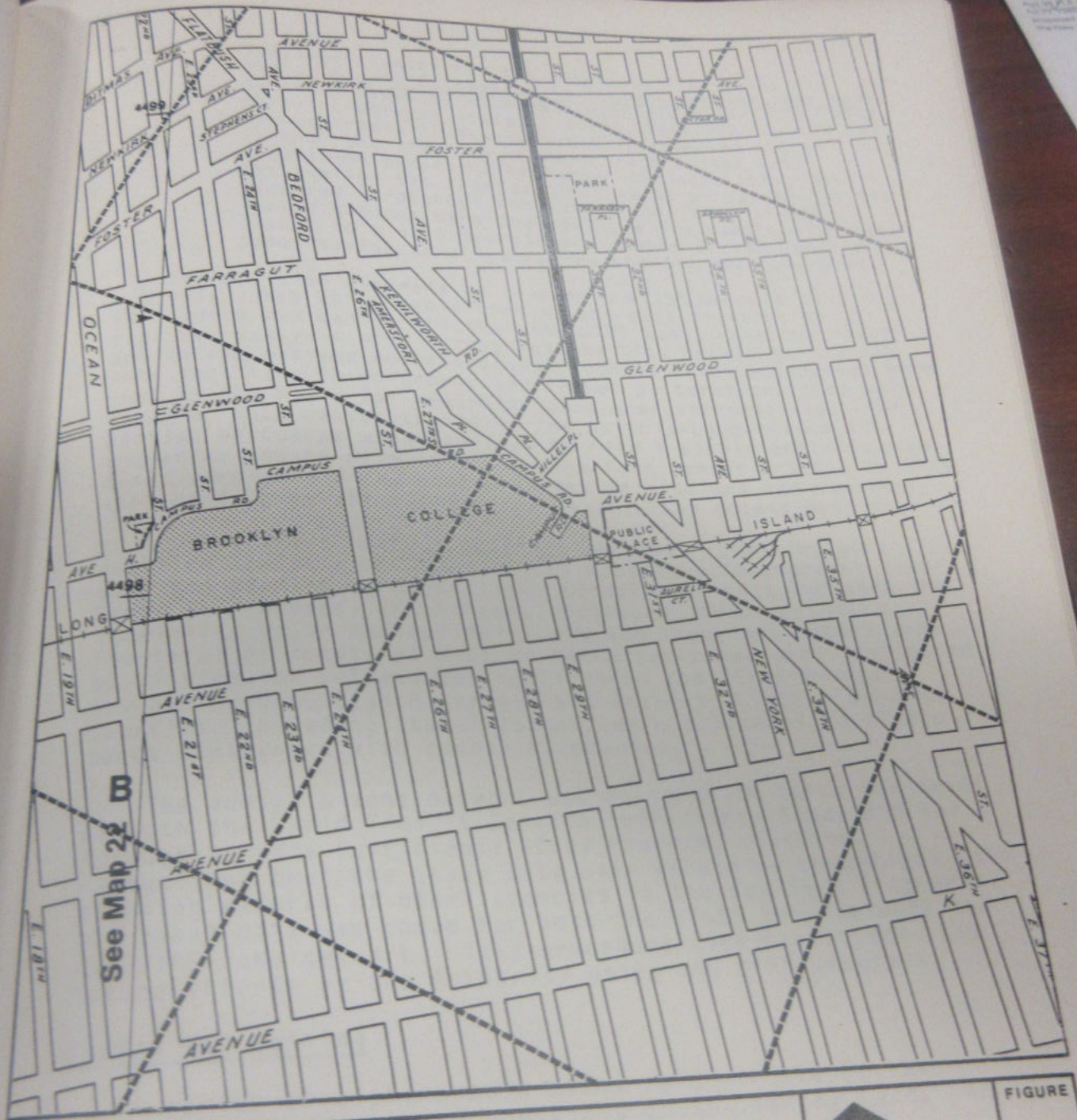
- o The Tri-State Regional Planning Commission network divides New York City into 175 uniform analysis zones. The network was developed in 1963 in conjunction with a regional origin-destination survey and essentially parallel the Manhattan street system in Midtown. Because the zones are part of a uniform network intended for regional planning, they were too large to permit the detailed level of analysis required by the Study.
- o The Bronx Study used zones that were based on the Tri-State zone network. The Tri-State zones were subdivided to account for areas that have diverse characteristics, such as differing land uses or population densities.

o The Urban Transportation Planning System (UTPS) zone network is part of a package of computer programs created by USDOT to assist local transportation planning. The UTPS zones for New York City average a quarter-square mile in size, with the actual size varying to reflect the land uses within a particular zone. The UTPS zones were originally derived from the Tri-State zones, so UTPS data can be aggregated for comparison with Tri-State data. There were several problems, however, associated with using the UTPS zones. First, the zones were arranged to form a grid that parallels the Manhattan street system in Midtown. While this arrangement works well for gross analysis in most of Manhattan, it arbitrarily splits neighborhoods, traffic generators, and geographic boundaries in most of the City. As an example, several UTPS zones on the Brooklyn-Queens border straddle Newtown Creek at places that have no physical crossings.

A second problem was that these zones combined diverse land uses into a single zone. For example, Brooklyn College is split between four different UTPS zones, each zone containing part of the campus and the surrounding neighborhood (Figure 14). Yet the college differs greatly from the surrounding neighborhood in terms of frequency of trips generated, orientation of destinations, and timing of peak demand periods. By treating the college as a separate entity, the Study was able to closely identify the demand of specific generators in the Flatbush area.

Finally, the UTPS zones were insensitive to the alignment of the rapid transit system by not distinguishing between destinations on different, but adjacent transit services. As an example, a routing choice in Manhattan between the Sixth Avenue Line and the Eighth Avenue Line could be important in the evaluation of a new rapid transit route. The UTPS zones, however, overlap the service area of both lines. Similarly, the UTPS zones in Queens straddle the Long Island Expressway. The neighborhoods on both sides of the expressway are residential, but differ in population density. Further, the neighborhoods north of the expressway have bus service primarily oriented towards the Flushing Line, while the neighborhoods south of the expressway have bus service primarily oriented towards the Queens Boulevard Line.

o Census tracts were created for use with 1970 Census Bureau data. Tract boundaries are almost always city streets and avoid bisecting geographic boundaries, so they can be combined to delineate neighborhoods and separate land uses. Also, use of census tracts allow the survey data to be supplemented by census data.



UTPS Zones



FIGURE
14



New York City
Transit
Authority

Previous studies for the Authority (for example: Rapid Transit Extension to Northeast Bronx, New York, by the consulting firm URS/Coverdale & Colpitts) used census tracts as analysis zones. There are about 3,000 census tracts in New York City (excluding Staten Island) and the size of each tract varies with population density (the higher the population density, the smaller the tract). This level of detail was not required throughout the entire city and, if the analysis zones were too small, a low sample size could result in a disproportionate number of low density zones having no trips represented in the data base.

The decision was made to develop a RTSSS network of 1,439 UTPS zones and census tracts. The UTPS zones were the right size for analysis work throughout the City except in the CBD and in the extreme outerboroughs. Census tract boundaries were more sensitive to geography and travel patterns and they were used as the basis for analysis zones wherever possible. For example, four census tracts in the Astoria-Long Island City section of Queens were combined to form a single analysis zone a quarter-square mile in size. The four census tracts, in this case, were only a few square blocks in size and had similar land uses, population densities, and subway access options.

Census tracts were subdivided in areas requiring more detailed analysis or where tracts contained incongruous land uses and population densities. Examples of this included the Coney Island area, JFK Airport, colleges, transportation terminals, major medical terminals and important retail area. The level of detail of Midtown Manhattan zones were configured to distinguish between destinations on the Sixth Avenue, Seventh Avenue, Eighth Avenue, and Broadway Lines. Suburban counties, including Staten Island, were allocated to single zones contiguous with county boundaries.

The analysis zone network was designed to serve the needs of both the Rapid Transit Service Sufficiency Study and the Borough Service Sufficiency Study Program. Further, recognizing that the Study data base should be compatible with planning efforts of other agencies in the New York City area, all zonal data was coded for both the RTSSS zone network and the UTPS zone network. This procedure also facilitates any future efforts by the Authority using the UTPS programs.

Coding and Editing

A series of alphanumeric codes were created for each possible response to the questions on the survey card. These codes included:

- o Three-digit numeric codes for each of the 435 stations, increasing from south (95th Street/Fourth Avenue) to north (Woodlawn).

- o Two-digit codes for each of the 25 subway routes. Additional codes were developed for ambiguous responses (for example: a passenger may have specified taking the "Lexington Avenue Express" without indicating the #4 or #5 by name. This response would have been coded "LX").
- o Four-digit codes for each bus route (TA and private) and commuter rail line used to access subway service.
- o Four-digit codes for each of the 1,439 analysis zones.

The coding process was divided into several tasks, with office aides entering the coded data onto forms for subsequent keypunching. The tasks were divided as follows:

- o Train Coding: Coding of questions relating to the subway portion of the trip, including first station, trains used, transfer stations, last station.
- o Geocoding: Coding of appropriate RTSSS and UTPS zone codes for questions relating to trip origin and destination.
- o Access and Miscellaneous Coding: Coding of questions relating to modes of access and the remainder of the card.

By dividing the coding process into tasks, each person became a "specialist" in the series of questions they were working on. This helped to maintain a fast, accurate coding process. As coding continued, other procedures developed that improved the efficiency and accuracy of the work, including:

- o The cards were sorted by station of origin. This allowed the office aides to learn about one line at a time and to master such details as the times that particular subway transfers are possible and how this relates to the routes passengers use to reach their destinations. Aides could then decipher unclearly worded trip descriptions, increasing the number of valid responses that otherwise would have been edited out.
- o The sorting process also facilitated geocoding by helping the office aides locate addresses around a given station station, rather than those scattered throughout the entire city. This, in turn, permitted the use of large scale sectional maps of the City, each containing about 10 or 20 subway stations.
- o Geocoding lists were compiled to provide zone codes for major office buildings, stores, landmarks, hospitals, housing projects, schools, colleges, sports facilities, and other traffic generators. This device minimized the need to refer to maps and saved time.

- o For the Borough of Manhattan, all addresses in The Red Book (a street index of New York City) were coded by zone. Therefore, any trips that started or ended in Manhattan (the vast majority) could have at least one end quickly coded without a map reference.

To reduce the time required for geocoding, the study staff investigated using the NYCDOP Street Address Matching System (SAMS), which can locate exact addresses by census tract or tax block. After review, however, it was decided not to use SAMS since only about half the returned cards had exact addresses, adding to the necessary time for editing (i.e.: correcting spelling, using appropriate hyphens, etc.). Further, since many respondents indicated only intersections, a supplemental file of intersection locations would need to be developed.

The same procedures were used to code the weekend survey, except that trip origins and destinations were not geocoded. This was done because the weekend survey was conducted only at a limited number of stations, as opposed to the weekday survey that was conducted at all stations. Therefore, it would not be possible to construct a complete origin-destination data base with this information. In addition, the smaller sample size makes the weekend data significantly less reliable on the zone level. Further, the zone coding of weekday information was in part to facilitate analysis of station access issues. As the majority of the 59 stations surveyed only have a single station entrance open on weekends, they would not be affected by the station access analysis. Therefore, only origin zone information was coded for the nine weekend survey station with more than one open entrance and where a particular station access issue was identified.

The evening theatre survey was coded for all questions except that trip destinations were not geocoded. This survey consisted of less than 3,000 responses and destinations were scattered over zones throughout the metropolitan area. Trip origin zones were coded as this information was useful in analyzing evening station access issues.

The evening cordon survey required an entirely different procedure because the sample was too small to justify a station-by-station breakdown. Instead, the information was grouped by 73 line segments (described in the next section). The coding process sorted the cards by serial number to their distribution cordon line, editing out cards that were filled out incorrectly. Origin stations and destination stations were identified and the appropriate line segment numbers were manually tabulated onto a 73 x 73 matrix. Manual processing of this data was appropriate due to the relatively small sample size involved and the costs associated with developing special coding processes and computer programs for the different format used by the evening survey card.

Computer programs were developed to edit the coded survey data, which included checks for the following:

- o All codes were checked to ensure their validity.
- o Train trips were checked to ensure they did not describe round trips.
- o Last train codes were checked to ensure that they matched the codes for the last train transferred to in Question #4 or, if no transfers were made, the codes for the first train used.
- o Trip origin and destination zones were checked to ensure they did not describe the same zone, except for general area zones, such as "Manhattan Unspecified".
- o The origin station and time were checked to ensure they were consistent with the place and time of distribution indicated by the serial number on the card.

After these checks, a direction of travel (northbound or southbound) was assigned to each part of the train trip. Direction was determined by subtracting the code for the origin station from the code for the destination (or transfer) station. Since all stations were numerically coded from south to north, if the resulting difference was positive, then the trip was northbound; if it was negative, then the trip was southbound. Finally, a weighted value was assigned to each response to indicate the actual number of trips it represents. The hourly samples from each control area were weighted in the following manner:

$$F_{ij} = \frac{T_{ij}}{S_{ij}}$$

where F_{ij} describes an expansion coefficient applied to the returns from Control Area i during Hour j , T_{ij} is the total number of passengers that entered through Control Area i during Hour j , and S_{ij} is the sample from Control Area i during Hour j .

Development of Line Segments

The aggregation of data by line segments provided information which summarized the data base collected on a station-by-station basis. These line segment summaries were used in conjunction with station-by-station summaries to analyze major routing issues (in Chapter III).

As the Authority did not have an established series of line segments that was compatible with the Study, the system was divided into 73 line segments consistent with route and service analysis. The line segments were created in accordance with the following guidelines:

- o The segments were separated by line.
- o The segments were separated by geography. In general, segments avoided crossing borough or cordon lines.
- o The segments were sensitive to routing issues. Stations could be combined to facilitate analysis of major routing issues.
- o Stations where passengers have similar service and routing options were combined.
- o The segments were kept as large as possible to minimize the total number of segments.
- o Segments that differentiate between local and express services were avoided, except where required for specific routing issues.
- o Where different lines merge, the merger station was assigned to the trunk line segment. Where different lines intersect, the transfer station was assigned to the outbound segment.

Survey Results

Computer programs were developed to produce a number of output tables from the data base. The output tables organized the Study data base into useful summaries and correlations for analysis. A full description of the output tables and samples of each are contained in Appendix A.

Beyond assisting the evaluation of study alternatives, the RTSS data base will be used by the Authority for route and service planning. The continuing validity of the origin-destination data was investigated by contacting transit industry specialists experienced in the practical application of origin-destination survey data. While passenger volumes will change, the percentage distribution of ridership at each station will remain relatively constant unless there are substantial changes in system configuration or population demographics; the New York City region has not experienced changes of this magnitude since 1979. This is consistent with transit industry standards for such data.

III EVALUATION OF ALTERNATIVES

With the RTSS data base assembled, the relationship between existing operations and trip-making patterns was examined in order to match service levels with identified demand. This analysis of alternative services was not intended to restructure the entire rapid transit route structure starting from a zero base---such a comprehensive restructuring would have exceeded the resources allocated to the Project. Instead, the study staff, in concurrence with the Project Steering Committee, decided to focus on incremental changes in routes and services. Proposals could entail changes in terminals for existing routes, modification in local/express service patterns in appropriate corridors, changes in service hours, rerouting a portion of an existing service or creating entirely new routes.

Guidelines for Developing Alternatives

The Study used the following guidelines for evaluating route and service change proposals:

- o To provide routes that reflect the current travel patterns of passengers, minimizing transfers.
- o To provide a level of service on each line that better matches the identified demand for service.
- o To simplify the route structure.
- o To maintain or improve the operating efficiency of the rapid transit system.
- o To remain within the current budget and physical plant for rapid transit operations.
- o To avoid unnecessary disruptions of present services without clearly demonstrated reason.

The route and service change proposals could not exceed current requirements for labor and equipment. They could not require changes to existing track configurations nor contradict the operating policies of the Rapid Transit Transportation Department. These operating policies included the following prohibitions:

- o Trains may not relay on mainline, active track as a delayed relaying train can interfere with other train movements. The few existing exceptions to this rule include the "JFK Express", which relays on active track at Howard Beach, and the #3 Shuttle, which relays at 135th Street/Lenox Avenue after midnight when there are few conflicting train movements.

- o The merging of two rail lines should not require the lines to physically cross in front of one another. For example, the Lexington Avenue Line service that terminates at Brooklyn Bridge Station via the City Hall Loop must operate local along Lexington Avenue, and the service that operates through Brooklyn Bridge Station from the IRT Brooklyn Line must operate express along Lexington Avenue. Any other service configuration (as shown on Figure 15) would require the local and express service to cross north of Brooklyn Bridge, an action which could result in congestion and delays during peak service periods.

Other specific operating policies will be explained in detail when they occur in the alternative analysis.

Alternatives Analysis

The rapid transit system beyond the limits of the Manhattan CBD was first divided into distinct study corridors to facilitate developing route and service change proposals. The A-Division (IRT) rapid transit lines in the Bronx were not included, as that would duplicate the previous efforts of the Bronx Study*. The eighteen study corridors are listed below; in addition, another category was established for issues within the Manhattan CBD that did not relate to the issues associated with any particular corridor:

- Washington Heights Corridor
- Grand Concourse Corridor
- Central Park West Corridor
- Queens Boulevard Corridor
- Astoria Corridor
- Flushing Corridor
- Broadway-Brooklyn/Jamaica Avenue Corridor
- 14th Street/Canarsie Corridor
- Fulton Street-Rockaways Corridor
- IRT Brooklyn Corridor
- Culver Corridor
- Fourth Avenue Corridor
- Brighton Corridor
- West End Corridor
- Sea Beach Corridor
- IRT Lexington Avenue Corridor
- IRT Seventh Avenue/Broadway Corridor
- Brooklyn-Queens Crosstown Corridor

The latter three corridors were deleted from the alternatives analysis---the physical capacity and track configuration of the IRT Lexington Avenue and Seventh Avenue/Broadway Corridors limited possible route and service changes

* A summary of Bronx Study recommendations are contained in Appendix C.



Track Diagram



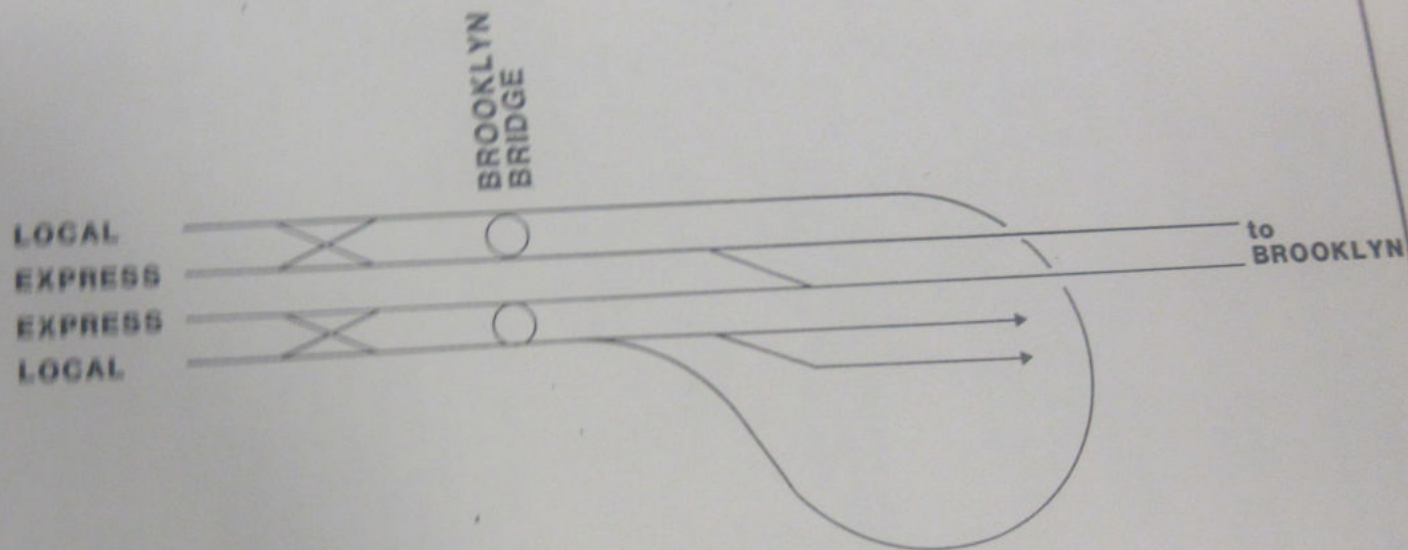
FIGURE

15



New York City
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Authority

LEXINGTON AVENUE LINE



to the alterations which were investigated in the Bronx Study. The possible route and service changes for the Crosstown Lines were similarly limited by physical capacity and track configuration.

Finally, the sixteen remaining study corridors were grouped geographically and operationally to facilitate the alternatives analysis, as follows:

1. IND Upper Manhattan/Bronx Corridors:
 - Washington Heights Corridor
 - Grand Concourse Corridor
 - Central Park West Corridor
2. Queens Boulevard-Astoria Corridors:
 - Queens Boulevard Corridor
 - Astoria Corridor
3. Flushing Corridor
4. Eastern Division Corridors:
 - Broadway-Brooklyn/Jamaica Avenue Corridor
 - 14th Street/Canarsie Corridor
5. Fulton Street-Rockaways Corridor
6. IRT Brooklyn Corridor
7. Culver Corridor
8. Southern Division Corridors:
 - Fourth Avenue Corridor
 - Brighton Corridor
 - West End Corridor
 - Sea Beach Corridor
9. Intra-Manhattan Issues

Disparities between existing service patterns and service demand, called "demand issues", were identified for each of the study corridors by applying information from the RTSSS data base, in particular the line segment summaries and station-by-station summaries. These issues included overcrowding on certain segments, imbalanced local/express service loadings, and potential service changes to be investigated (change of terminals, routings, service hours, local/express operation, etc.). Attention was also given to examining some services that were no longer operated to determine why they were not successful.

Once identified, route and service alternatives were developed to address the demand issues identified for each corridor. Each alternative was reviewed for advantages and disadvantages. The proposed alternatives provide the greatest benefit and the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes.

IND Upper Manhattan/Bronx Corridors

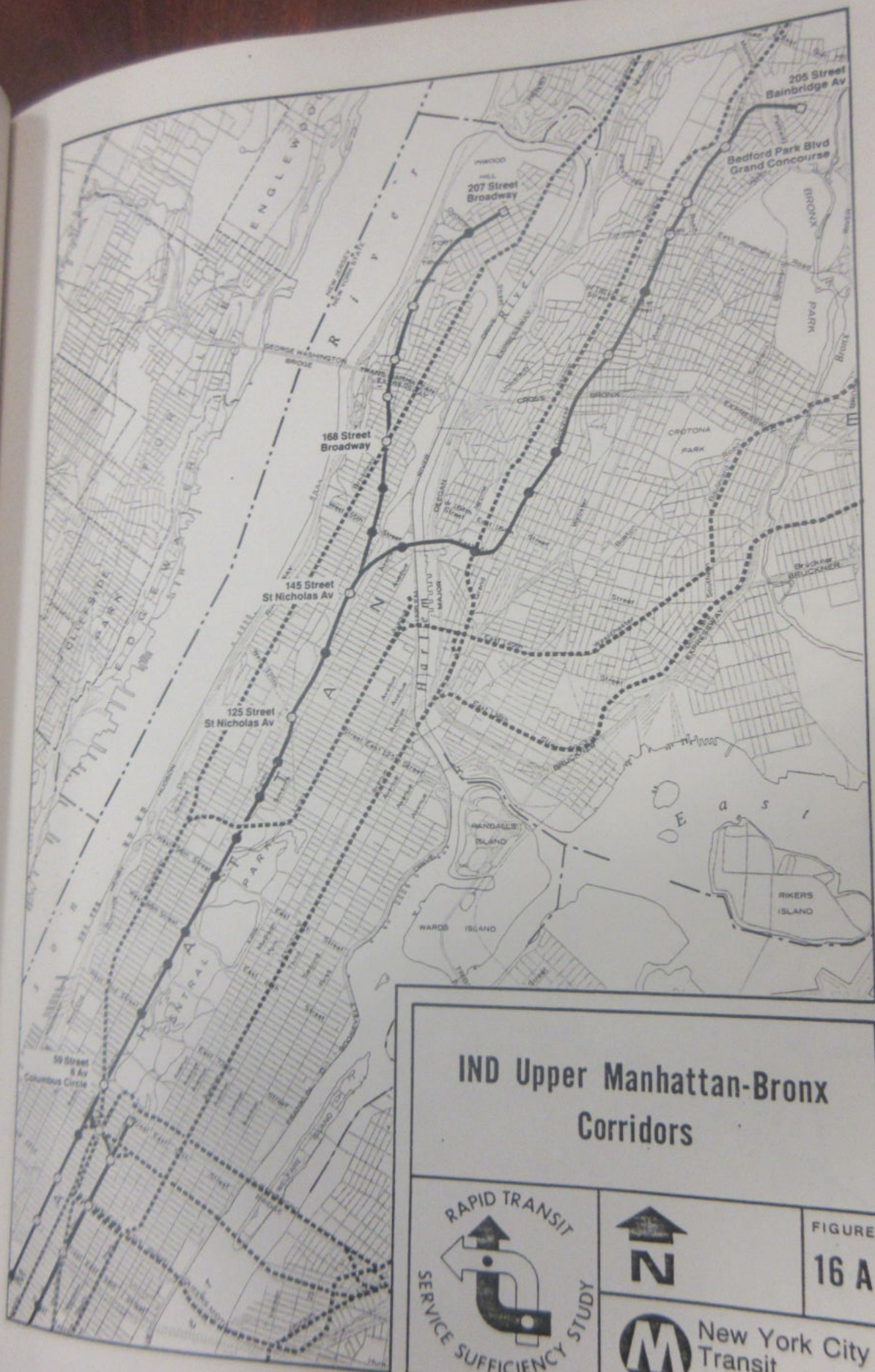
The IND Upper Manhattan/Bronx Corridors encompass three separate corridors serving Upper Manhattan and the Bronx; the Central Park West Corridor, the Washington Heights Corridor, and the Grand Concourse Corridor. These corridors are defined by the alignment of their namesake lines.

The Central Park West Corridor is defined by the alignment of the Central Park West Line through the Upper West Side of Manhattan between 59th Street-Columbus Circle and 145th Street/St. Nicholas Avenue. From Columbus Circle, the line runs north as a four-track subway under Central Park West, Eighth Avenue, and St. Nicholas Avenue to 145th Street. The southern end of the line connects with the IND Sixth and Eighth Avenue Lines to Midtown, Lower Manhattan and Brooklyn. The northern end connects with the Washington Heights Line to Upper Manhattan and the Grand Concourse Line to the Bronx. The major transfer station along the Central Park West Line is Columbus Circle, where passengers can transfer between local and express services of Sixth, Seventh (local only) and Eighth Avenue Lines. Transfers between the Sixth and Eighth Avenue local and express services are frequently made at other Central Park West express stops.

Land use in the corridor is predominantly high-density residential, with major commercial activity along 125th Street, Harlem. The corridor borders Central Park for 2.5 miles and contains many cultural institutions and recreational facilities, including the New York Coliseum, the American Museum of Natural History, the Hayden Planetarium and the New York Historical Society. Lincoln Center is within walking distance of the Columbus Circle Station.

The Washington Heights Corridor is defined by the alignment of the Washington Heights Line through Upper Manhattan between 145th Street/St. Nicholas Street and 207th Street/Broadway. From 145th Street, the line runs north as a four-track subway under St. Nicholas Avenue and Broadway to 168th Street; a small train yard is located at 168th Street, where trains can relay. The line continues north as a two-track subway facility under Broadway, Fort Washington Avenue, Fort Tryon Park and Broadway to its terminus at 207th Street. The major transfer station on the Washington Heights Line is 168th Street. Here, passengers can transfer between Eighth Avenue Line services and the local Seventh Avenue Line to the Upper West Side and the Bronx.

Land use in the corridor is predominantly high-density residential, with commercial districts in the vicinity of 168th Street/Broadway, 181st Street/Fort Washington Avenue and Dyckman Street. Cultural and recreational activities along the corridor include the Cloisters, Fort Tryon Park, and Inwood Hill Park. The George Washington Bridge Bus Station is located adjacent to 175th Street/Fort Washington Avenue Station and provides connections with intercity and commuter buses to New Jersey and upstate New York.



IND Upper Manhattan-Bronx Corridors



FIGURE
16 A



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The Grand Concourse Corridor is defined by the alignment of the Grand Concourse Line through Manhattan and the Bronx north of 145th Street/St. Nicholas Avenue to its terminus at 205th Street/Bainbridge Avenue. From 145th Street, the line runs north as a three-track subway to 155th Street/Eighth Avenue, then via the 161st Street Tunnel under the Harlem River to 161st Street, the Bronx. The line continues beneath 161st Street and Grand Concourse as far as Bedford Park Boulevard. At Bedford Park Boulevard, two yard leads into Concourse Yard are configured to permit trains to relay, while two tracks continue north, crossing Moshulu Parkway and terminating at 205th Street and Bainbridge Avenue. The major transfer station on the Grand Concourse Line is 161st Street/Grand Concourse. Here, passengers transfer between the Grand Concourse Line services and the Lexington Avenue Line to the East Side, or to Woodlawn at Jerome Avenue, the Bronx.

Land use in the corridor is predominantly high-density residential, with light and heavy industry along the Harlem River. Commercial districts are located at 170th Street/Grand Concourse, Fordham Road, and 205th Street/Bainbridge Avenue, the Bronx. Yankee Stadium and the Bronx County Courthouse are adjacent to 161st Street Station.

Current Service

Five routes currently use the IND Upper Manhattan/Bronx Lines: the "A", "AA", "B", "CC" and "D". Current operation of these routes is as follows:

- "A" (Eighth Avenue Express) operates between 207th Street/Broadway, Manhattan, and either Lefferts Boulevard or Far Rockaway, Queens, at all times except nights. At night, the "A" operates local service between 207th Street and Lefferts Boulevard; the "A" Round-Robin provides Far Rockaway service at night.
- "AA" (Eighth Avenue Local) operates between 168th Street/Broadway and Chambers Street-World Trade Center, Manhattan, at all times except peak periods and nights.
- "B" (Sixth Avenue Local) operates between 57th Street/Sixth Avenue, Manhattan, and Coney Island, Brooklyn, at all times except nights; the southbound "B" operates express on Sixth Avenue, Manhattan, during PM peak periods. The "B" (Sixth Avenue Express) also operates between 168th Street/Broadway, Manhattan, and Coney Island, Brooklyn, during peak periods. Some "B" trains (both locals and expresses) are short-turned at Bay Parkway, Brooklyn. At nights, two "B" shuttles operate: between 57th Street/Sixth Avenue and 50th Street/Sixth Avenue, Manhattan, and between 36th Street/Fourth Avenue and Coney Island, Brooklyn.

"CC" (Eighth Avenue Local) operates between Bedford Park Boulevard, the Bronx, and either Euclid Avenue, Brooklyn, or Rockaway Park, Queens, during peak hours only. At other times (except nights), the "CC" provides shuttle service between Broad Channel and Rockaway Park.

"D" (Sixth Avenue Express) operates between 205th Street/Bainbridge Avenue, the Bronx, and either Brighton Beach or Coney Island, Brooklyn, at all times. The "D" operates express in the peak direction between Bedford Park Boulevard, the Bronx, and 145th Street/ St. Nicholas Street, Manhattan (southbound AM/northbound PM).

The "A" and "D" currently operate express along Central Park West and the "AA" provides local service, supplanted by the "B" and "CC" during peak periods. After midnight, the "AA" does not operate and the "A" operates local.

Demand Issues

Peak and off-peak period demand from the Central Park West, Washington Heights and Grand Concourse Corridors is presented on Tables 2 through 4. N.B.: the demand figures presented on these tables, as well as the demand figures presented throughout this report, are responses weighted to reflect total ridership (as explained in Chapter II).

TABLE 2
CENTRAL PARK WEST-CORRIDOR DEMAND
PEAK PERIOD (6AM to 10AM)

DESTINATIONS	LOCAL STOPS		EXPRESS STOPS		TOTAL ALL STOPS	
53rd ST-MHTN	8.7%	1,138	13.1%	1,493	10.7%	2,631
EIGHTH AV-MIDTOWN	5.5%	716	9.5%	1,089	7.4%	1,805
EIGHTH AV-L. MHTN	16.5%	2,164	16.9%	1,933	16.7%	4,097
SIXTH AV-MIDTOWN	39.2%	5,133	27.2%	3,111	33.6%	8,244
HOUSTON-ESSEX	0.8%	102	5.5%	632	3.0%	734
OTHER	29.3%	3,835	27.8%	3,179	28.6%	7,014
TOTAL		13,088		11,437		24,525

OFF-PEAK (11AM to 2PM)

DESTINATIONS	LOCAL STOPS		EXPRESS STOPS		TOTAL ALL STOPS	
53rd ST-MHTN	8.2%	226	8.8%	690	8.7%	916
EIGHTH AV-MIDTOWN	8.4%	232	4.7%	367	5.7%	599
EIGHTH AV-L. MHTN	8.8%	242	16.7%	1,302	14.6%	1,544
SIXTH AV-MIDTOWN	25.5%	701	12.1%	942	15.6%	1,643
HOUSTON-ESSEX	0.8%	21	3.0%	236	2.4%	257
OTHER	48.3%	1,331	54.7%	4,272	53.0%	5,603
TOTAL		2,753		7,809		10,562



Passenger Demand

FIGURE

17



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CENTRAL PARK WEST DEMAND (LOCAL & EXPRESS STATIONS)

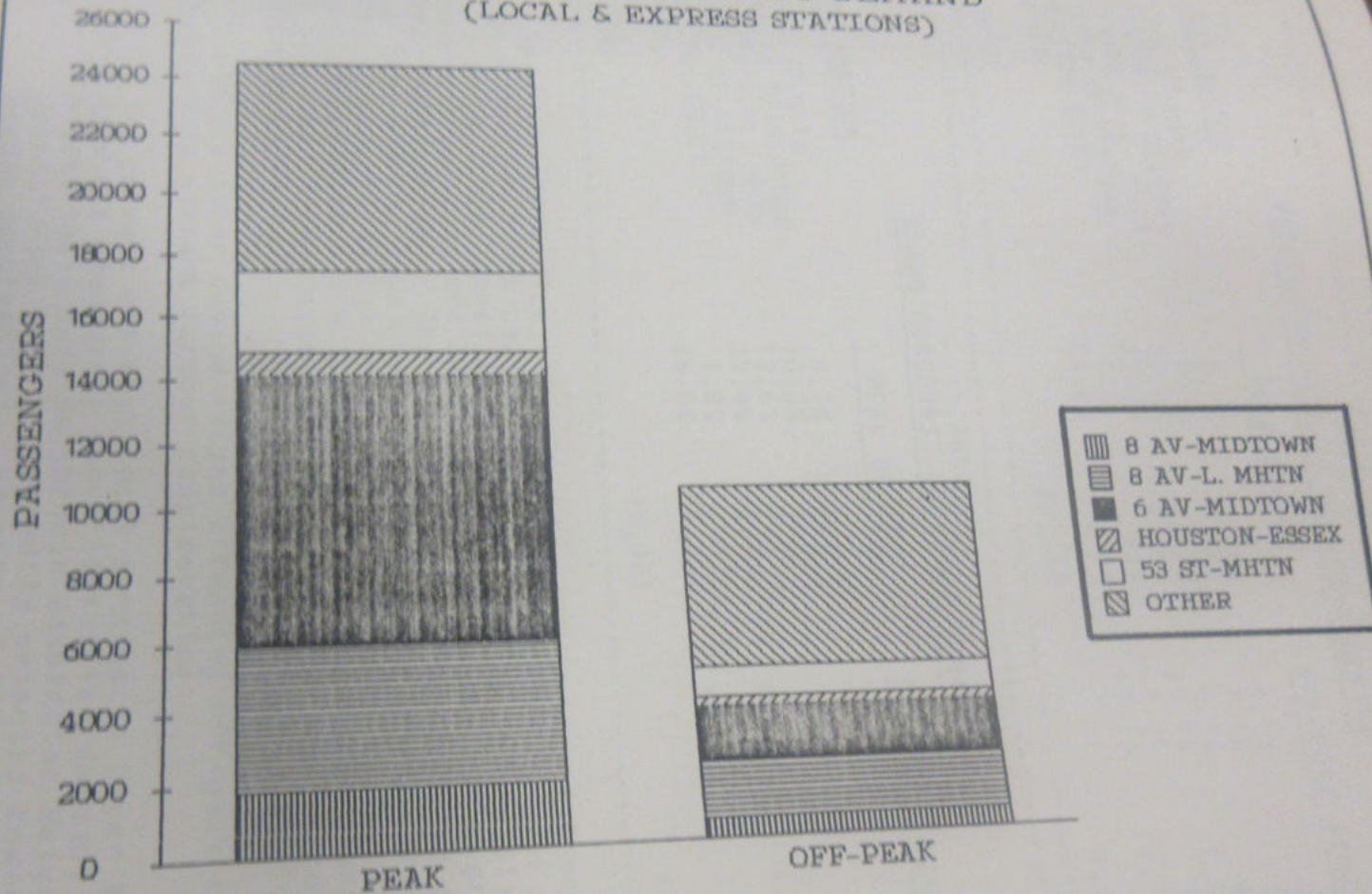


TABLE 3 WASHINGTON HEIGHTS CORRIDOR DEMAND				
DESTINATION	PEAK DEMAND		OFF-PEAK DEMAND	
53rd ST-MHTN	6.7%	1,984	5.1%	237
EIGHTH AV-MIDTOWN	5.2%	1,542	7.1%	332
EIGHTH AV-L. MHTN	21.9%	6,438	9.7%	453
SIXTH AV-MIDTOWN	39.1%	11,513	29.4%	1,368
HOUSTON-ESSEX	0.9%	279	2.8%	129
OTHER	26.2%	7,703	45.9%	2,141
TOTAL		29,459		4,660

TABLE 4 GRAND CONCOURSE CORRIDOR DEMAND				
DESTINATION	PEAK DEMAND		OFF-PEAK DEMAND	
53rd ST-MHTN	6.2%	2,292	5.9%	382
EIGHTH AV-MIDTOWN	10.6%	3,909	6.3%	411
EIGHTH AV-L. MHTN	13.6%	5,042	5.9%	386
SIXTH AV-MIDTOWN	33.4%	12,351	24.9%	1,616
HOUSTON-ESSEX	1.2%	435	0.9%	58
OTHER	35.0%	12,952	56.1%	3,648
TOTAL		36,981		6,501

Peak period service reflects identified demand from the IND Upper Manhattan/Bronx corridors. About 91,000 AM peak riders board along these lines; 32,000 (35%) are bound for Sixth Avenue destinations and 24,000 (26%) are bound for Eighth Avenue destinations. The peak period service pattern provides each line with an equal number of Sixth and Eighth Avenue services (except at the northern most extremities: only the "A" operates north of 175th Street on the Washington Heights Line and only the "D" operates to 205th Street on the Grand Concourse Line).

There are other demand issues affecting off-peak service, however, that warrant further consideration:

- o The current off-peak local service in Upper Manhattan does not adequately serve identified demand. All midday local service through Washington Heights and Central Park West is currently oriented towards Eighth Avenue destinations. However, 1,000 riders from these local stations between 11AM and 2PM are oriented toward Sixth Avenue destinations, compared to 470 riders oriented towards Eighth Avenue destinations.



Passenger Demand

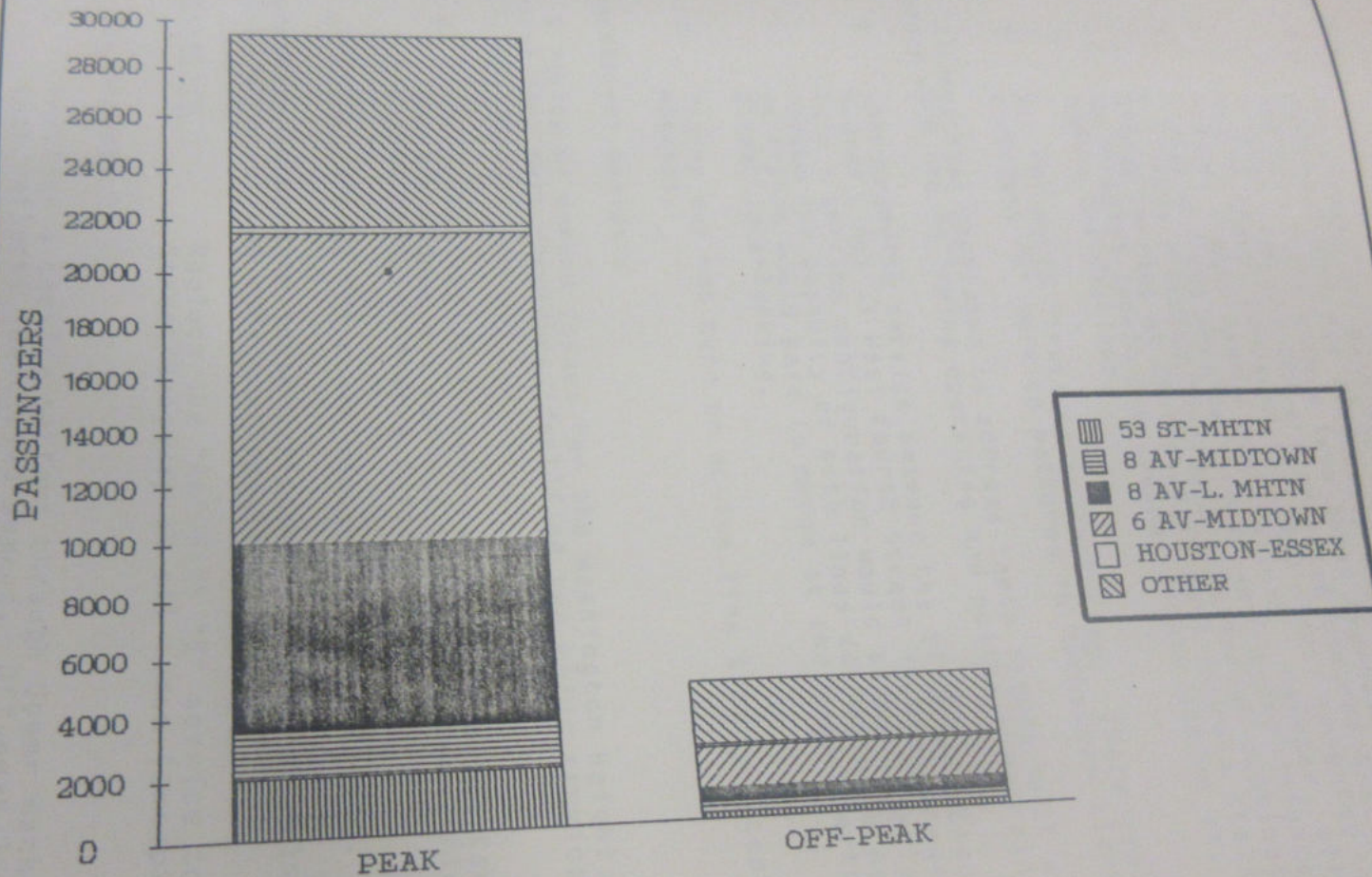
FIGURE

18



New York City
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WASHINGTON HEIGHTS DEMAND



- o The current off-peak express service in Upper Manhattan does not adequately serve identified demand. 3,200 riders from these express stations between 11AM and 2PM are oriented towards Sixth Avenue destinations, compared to 1,000 riders oriented towards Eighth Avenue destinations. However, all midday express service through Washington Heights is currently oriented towards Eighth Avenue destinations. Midday service at Central Park West express stations is oriented two-to-one towards Eighth Avenue vs. Sixth Avenue destinations.

- o The "B" route structure is confusing. There are four different "B" service patterns in Manhattan alone.

Alternatives developed to address these issues must also conform with the following operating and policy constraints:

- o Interchanging service between the Sixth and Eighth Avenue Lines at West Fourth Street is discouraged. Such a service configuration would significantly reduce the capacity of both lines during peak periods as trains would have to merge at the West Fourth Street Interlocking.
- o Trains may not turn on active line track (except nights).

Alternatives Analysis

A review of demand issues for the Washington Heights and Central Park West corridors identified two major service deficiencies:

- o The current off-peak service in Upper Manhattan and the Bronx does not reflect the strong identified demand to Sixth Avenue destinations.
- o The current "B" route structure is confusing.

In order to accommodate these deficiencies, the following service alternatives were developed and reviewed:

Alternative 1: Replace the "AA" with "B" service to 168th Street/Broadway at all times (except nights).

Advantages:

- o Provides a service pattern through Upper Manhattan that reflects identified demand. Off-peak local service through Washington Heights and Central Park West between 163rd Street and 72nd Street would be oriented towards Sixth Avenue destinations. 1,000 riders from these local stations between 11AM and 2PM that currently must transfer would have direct service.



Passenger Demand

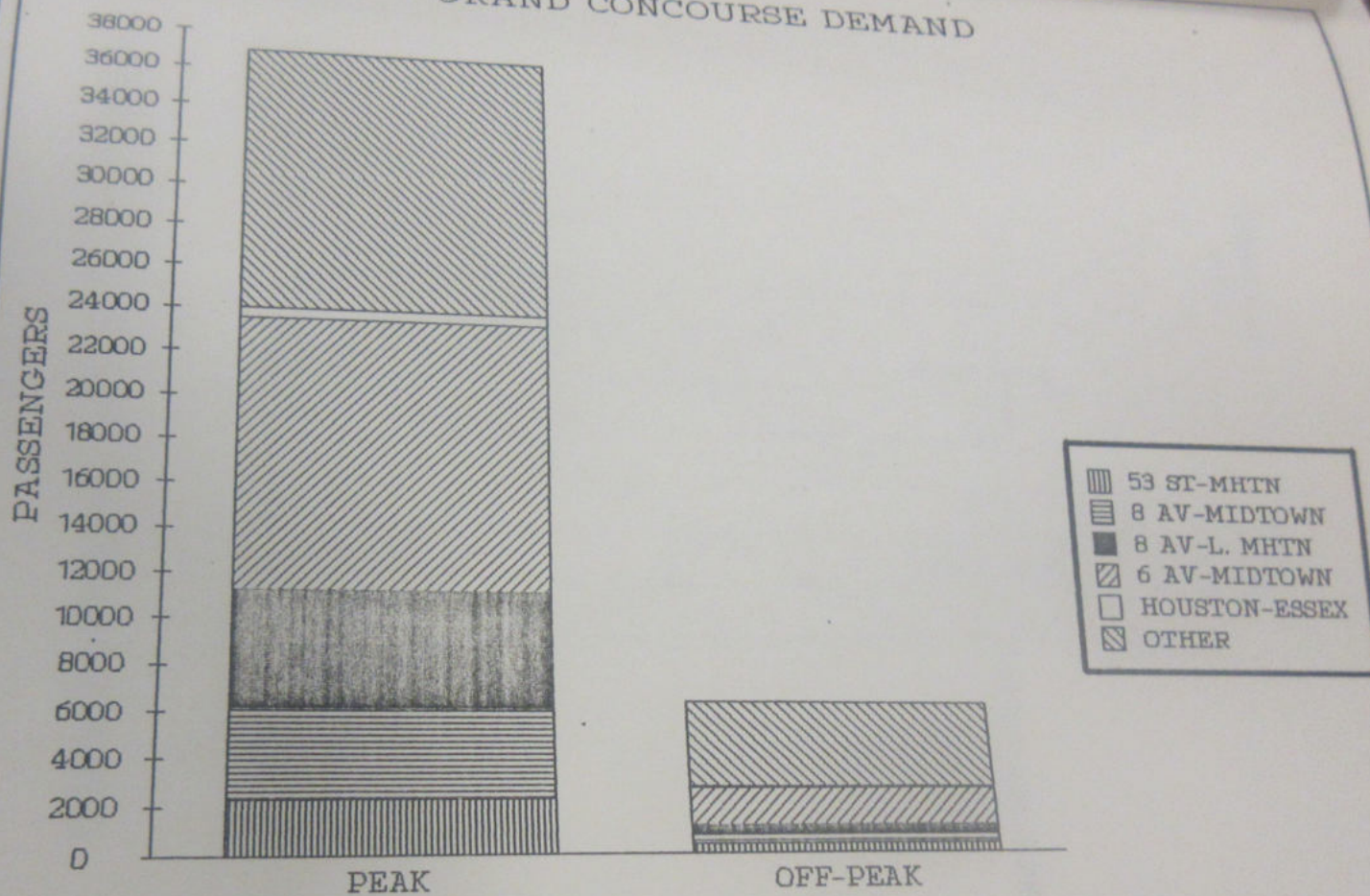
FIGURE

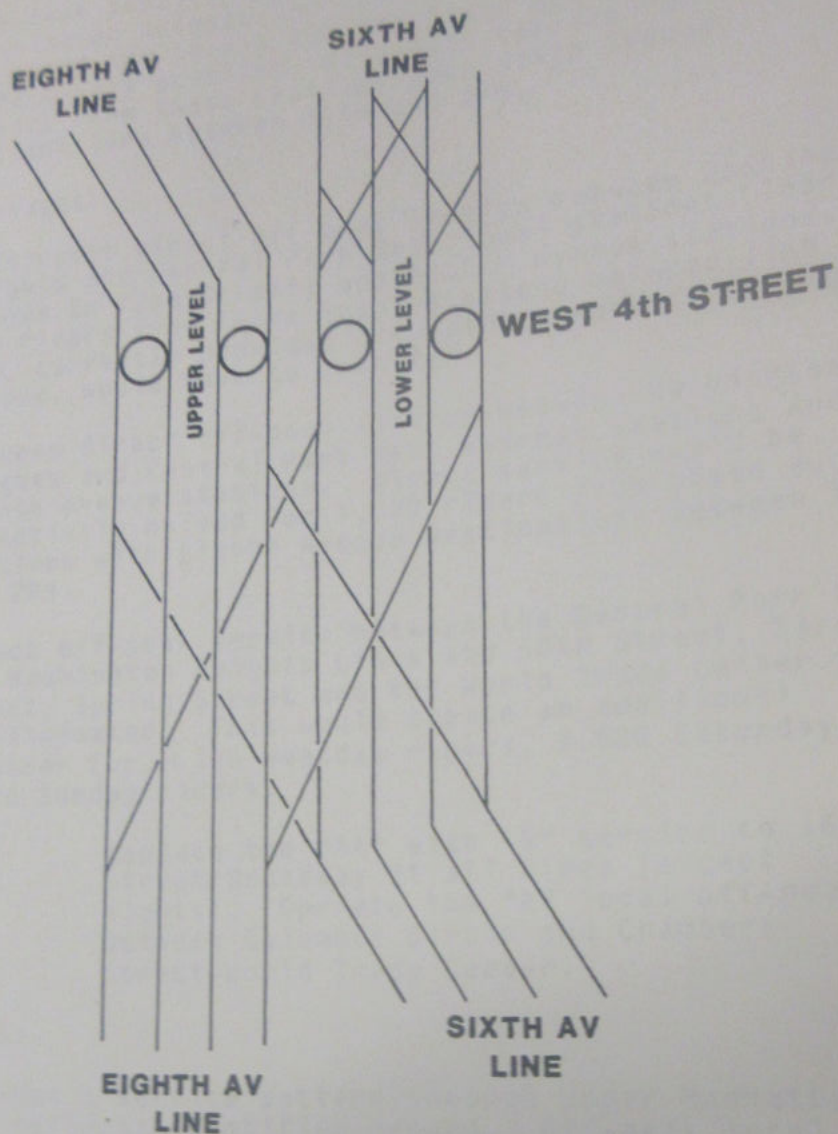
19



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Authority

GRAND CONCOURSE DEMAND





WEST 4th STREET INTERLOCKING



**Track
Diagram**



FIGURE

20



**New York City
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Authority**

Off-peak service to express stations through Washington Heights and Central Park West would be oriented two-to-one towards Sixth Avenue destinations, effectively doubling the direct service for 1,700 riders from these stations with Sixth Avenue destinations between 11AM and 2PM.

Disadvantages:

- o Eliminates direct off-peak service between Washington Heights and Central Park West local stations (163rd Street to 72nd Street) and Eighth Avenue stations. 500 riders from these local stations between 11AM and 2PM, currently provided with direct service to Eighth Avenue, would have to transfer.
- o Reduces direct off-peak service between Washington Heights and Central Park West express stations and Eighth Avenue stations. Direct service would be effectively halved for 1,000 riders from these express stations with Eighth Avenue destinations between 11AM and 2PM.
- o Direct off-peak service between the Central Park West and Washington Heights Lines and 50th Street, 23rd Street, Spring Street and the World Trade Center would be eliminated. This would create an additional transfer for 4,100 weekday riders, 3,000 Saturday and 2,300 Sunday riders.

Alternative 2:

Replace the "AA" with "B" service to 168th Street/Broadway at all times (except nights). Operate the "A" local off-peak between Columbus Circle and Chambers Street-World Trade Center.

Advantages:

- o Provides a service pattern through Upper Manhattan that reflects identified demand. Off-peak local service through Washington Heights and Central Park West between 163rd Street and 72nd Street would be oriented towards Sixth Avenue destinations. 1,000 riders from these local stations between 11AM and 2PM that currently must transfer would have direct service. Off-peak service to express stations through Washington Heights and Central Park West would be oriented two-to-one towards Sixth Avenue destinations, effectively doubling the direct service for 1,700 riders from these stations with Sixth Avenue destinations between 11AM and 2PM.
- o Relieves offpeak overcrowding on the "AA" at Spring Street Station that occurs when schools are dismissed, as noted by Manhattan Community Board #2. The "A" provides full-length trains compared to the four-car "AA" service.

Disadvantages:

- o Eliminates direct off-peak service between Washington Heights and Central Park West local stations (163rd Street to 72nd Street) and Eighth Avenue local stations. 500 riders from these Upper Manhattan local stations between 11AM and 2PM, currently provided with direct service to Eighth Avenue, would have to transfer.
- o Reduces direct off-peak service between Washington Heights and Central Park West express stations and Eighth Avenue stations. Direct service would be effectively halved for 1,000 riders from these Upper Manhattan express stations with Eighth Avenue destinations between 11AM and 2PM.
- o Eighth Avenue off-peak express service between 50th Street and Chambers Street would be eliminated, adding about two minutes to the current running time.

Alternative 3:

Replace the "AA" with "B" service to 207th Street/Broadway at all times (except nights). Terminate the "A" at 168th Street/Broadway at all times (except nights). Extend "A" to 207th Street/Broadway at night.

Advantages:

- o Provides a service pattern through Upper Manhattan that reflects identified demand. Peak period Washington Heights service between 207th Street and 175th Street would be oriented towards Sixth Avenue. 11,500 riders from these stations between 6AM and 10AM that currently must transfer would have direct service. Off-peak local service through Washington Heights and Central Park West between 207th Street and 72nd Street would be oriented towards Sixth Avenue destinations. 2,500 riders from these local stations between 11AM and 2PM that currently must transfer would have direct service. Off-peak service to express stations through Washington Heights and Central Park West (168th Street to 59th Street) would be oriented two-to-one towards Sixth Avenue destinations, effectively doubling the direct service for 1,700 riders from these stations with Sixth Avenue destinations between 11AM and 2PM.

Disadvantages:

- o Eliminates direct peak service between Washington Heights stations (207th Street to 175th Street) and Eighth Avenue stations. 4,000 riders from these stations between 6AM and 10AM that currently have direct service must transfer.

- o Eliminates direct off-peak service between Washington Heights and Central Park West local stations (207th Street to 72nd Street) and Eighth Avenue stations. 1,000 riders from these local stations between 11AM and 2PM, currently provided with direct service to Eighth Avenue stations, would have to transfer. Reduces direct off-peak service between Washington Heights and Central Park West express stations and Eighth Avenue stations. Direct service would be effectively halved for 1,000 riders from these Upper Manhattan express stations between 11AM and 2PM with Eighth Avenue destinations.
- o Direct off-peak service between the Central Park West and Washington Heights Lines and 50th Street, 23rd Street, Spring Street and the World Trade Center Terminal would be eliminated. This would create an additional transfer for 4,100 weekday riders, 3,000 Saturday riders and 2,300 Sunday riders.
- o Off-peak Eighth Avenue local service to 50th Street, 23rd Street, Spring Street and the World Trade Center would be halved.
- o Travel time between Washington Heights Line stations north of 168th Street and Midtown Manhattan would increase by about nine minutes.

Alternative 4:

Replace the "AA" with "B" service to 207th Street/Broadway at all times (except nights). Terminate the "A" at 168th Street/Broadway at all times (except nights). Operate the "A" local off-peak between Columbus Circle and Chambers Street-World Trade Center. Extend "A" to 207th Street/Broadway at night.

Advantages:

- o Provides a service pattern through Upper Manhattan that reflects identified demand. Peak period Washington Heights service between 207th Street and 175th Street would be oriented towards Sixth Avenue. 1,500 riders from these stations between 6AM and 10AM that currently must transfer would have direct service. Off-peak local service through Washington Heights and Central Park West between 207th Street and 72nd Street would be oriented towards Sixth Avenue destinations. 2,500 riders from these local stations between 11AM and 2PM that currently must transfer would have direct service. Off-peak service to express stations through Washington Heights and Central Park West would be oriented two-to-one towards Sixth Avenue destinations, effectively doubling the direct service for 1,700 riders from these stations with Sixth Avenue destinations between 11AM and 2PM.

Disadvantages:

- o Eliminates direct peak service between Washington Heights stations (207th Street to 175th Street) and Eighth Avenue stations. 4,000 riders from these stations between 6AM and 10AM that currently have direct service must transfer.
- o Eliminates direct off-peak service between Washington Heights and Central Park West local stations (207th Street to 72nd Street) and Eighth Avenue stations. 1,000 riders from these local stations between 11AM and 2PM, currently provided with direct service to Eighth Avenue, would have to transfer.
- o Reduces direct off-peak service between Washington Heights and Central Park West express stations and Eighth Avenue stations. Direct service would be effectively halved for 1,000 riders from these express stations with Eighth Avenue destinations between 11AM and 2PM.
- o Travel time between Washington Heights Line stations north of 168th Street and Midtown Manhattan would increase by about nine minutes.
- o Eighth Avenue off-peak express service between 50th Street and Chambers Street would be eliminated, adding about two minutes to the current running time.

Alternative-5:

Replace the "AA" with "B" service to 207th Street/Broadway at all times (except nights). Terminate the "A" at 168th Street/Broadway at all times (except nights). Operate the "A" local and the "B" express south of 168 Street/Broadway. ("A" extended to 207th Street/Broadway, nights).

Advantages:

- o Provides a service pattern to Washington Heights and Central Park West express stations that reflects identified demand. Peak express service through Washington Heights (207th Street to 175th Street) would be oriented towards Sixth Avenue destinations. 11,500 riders from these stations between 6AM and 10AM that currently must transfer would have direct service. Peak local service through Washington Heights and Central Park West (63rd Street to 72nd Street) would be oriented towards Eighth Avenue. 500 riders from these stations between 6AM and 10AM that currently must transfer would have direct service. Off-peak express service through Washington Heights and Central Park West between 207th Street and 175th Street would be oriented towards Sixth Avenue destinations. 1,500 riders from these express

stations between 11AM and 2PM that currently must transfer would have direct service. Off-peak service at express stations between 168th Street and 59th Street would be oriented two-to-one towards Sixth Avenue destinations, effectively doubling direct service for 1,600 riders from these express stations with Sixth Avenue destinations between 11AM and 2PM.

Disadvantages:

- o 7,400 riders from Washington Heights and Central Park West local stations (163rd Street to 72nd Street) between 6AM and 10AM with Sixth Avenue destinations, currently provided with direct service, would have to transfer.
- o 3,600 riders from Washington Heights stations (207th Street to 175th Street) between 6AM and 10AM with Eighth Avenue destinations, currently provided with direct service, would have to transfer.
- o 600 riders from Washington Heights stations north of 168th Street between 11AM and 2PM with Eighth Avenue destinations, currently provided with direct service, would have to transfer.
- o Eighth Avenue off-peak express service between 50th Street and Chambers Street would be eliminated adding about two minutes to the current running time.
- o To keep consistency between peak and off-peak service patterns, both peak express services on Central Park West would be oriented towards Sixth Avenue and both peak local services would be oriented towards Eighth Avenue. This does not reflect peak period demand.

Alternative 6:

Switch "A" and "D" alignments north of 145th Street. Operate the "D" to 207th Street/Broadway, Washington Heights and the "A" to 205th Street/Grand Concourse, the Bronx.

Advantages:

- o Provides a service pattern to Washington Heights and Central Park West express stations that reflects identified demand. All peak Washington Heights service (207th Street to 155th Street) would be oriented towards Sixth Avenue destinations. 11,500 riders from these stations between 6AM and 10AM that currently must transfer would have direct service. All peak Grand Concourse service (205th Street to 155th Street) would be oriented towards Eighth Avenue destinations. 3,900 riders from Grand Concourse express stations between 6AM and 10AM would have direct express service to Eighth Avenue. Off-peak

express service through Washington Heights and Central Park West between 207th Street and 175th Street would be oriented towards Sixth Avenue destinations. 1,500 riders from these express stations between 11AM and 2PM that currently must transfer would have direct service.

- o 700 riders from Grand Concourse stations between 11AM and 2PM that currently must transfer to Eighth Avenue destinations would have direct service.

Disadvantages:

- o 8,100 riders from Grand Concourse express stations between 6AM and 10AM that currently have direct service would have to transfer.
- o 4,000 riders from Washington Heights express stations between 6AM and 10AM that currently have direct service would have to transfer.
- o 600 riders from Washington Heights stations north of 168th Street between 11AM and 2PM with Eighth Avenue destinations that currently have direct service would have to transfer.
- o 2,000 riders from Grand Concourse stations between 11AM and 2PM that currently have direct service to Sixth Avenue destinations would have to transfer.
- o For consistency, both peak Washington Heights services should be oriented towards Sixth Avenue and both peak Grand Concourse services would be oriented towards Eighth Avenue. This does not reflect peak period demand.

Alternative 7:

Replace the "AA" with the "XB" operating from 168th Street/Broadway to World Trade Center via Sixth Avenue and West Fourth Street.

Advantages:

- o Provides a service pattern through Upper Manhattan that reflects identified demand. Off-peak local service through Washington Heights and Central Park West between 163rd Street and 72nd Street would be oriented towards Midtown Sixth Avenue and Downtown Eighth Avenue destinations. 1,000 riders from these local stations between 11AM and 2PM that currently must transfer would have direct service. Off-peak service at express stations through Washington Heights and Central Park West would be oriented two-to-one towards Midtown Sixth Avenue and Downtown Eighth Avenue destinations, effectively doubling the direct service for 1,700 riders from these stations between 11AM and 2PM with Sixth Avenue destinations.

- o 1,250 riders between 11AM and 2PM traveling between Sixth Avenue stations north of West Fourth Street and Eighth Avenue stations south of West Fourth Street (Spring Street, Canal Street and the World Trade Center) that currently must transfer will have direct service.

Disadvantages:

- o Eliminates direct off-peak service between Washington Heights and Central Park West local stations (163rd Street to 72nd Street) and Eighth Avenue stations north of West Fourth Street. 300 riders from these Upper Manhattan local stations between 11AM and 2PM currently provided with direct service to Eighth Avenue would have to transfer.
- o Reduces direct off-peak service between Washington Heights and Central Park West express stations and Eighth Avenue stations north of West Fourth Street. Direct service would be effectively halved for 400 riders from these Upper Manhattan express stations between 11AM and 2PM with Eighth Avenue destinations north of West Fourth Street.
- o Off-peak Eighth Avenue local service to 50th Street and 23rd Street would be halved.
- o World Trade Center trains will operate on two different levels at West Fourth Street ("A" & "E" upstairs, "XB" downstairs), creating passenger confusion.
- o Interchanging service between the Sixth and Eighth Avenue Lines at West Fourth Street would significantly reduce the capacity of both lines during peak periods as trains would have to merge at that station.

Alternative 8: Eliminate the "CC" north of 145th Street.
Operate the "D" local of Grand Concourse.

Advantages:

- o Provides a peak service pattern in the Bronx that reflects identified demand. Peak Grand Concourse "D" service would be totally oriented towards Sixth Avenue destinations. 6,600 riders from Grand Concourse local stations between 6AM and 10AM that currently must transfer would have direct service to Sixth Avenue.
- o Permits allocation of "CC" equipment to other parts of the system during peak periods.

Disadvantages:

- o Eliminates express service along the Grand Concourse, extending travel time (about two minutes from 205th Street) for 58,000 riders between 6AM and 10AM.

- o Eliminates direct service from Grand Concourse stations to Eighth Avenue for 7,100 riders between 6AM and 10AM.

Alternative 9:

Operate the "CC" at all times (except nights) from Bedford Park Boulevard to the World Trade Center. Replace the "AA" with the "B" to 168th Street/Broadway at all times (except nights).

Advantages:

- o Provides a simplified route structure, with peak and off-peak services nearly identical.
- o Provides direct off-peak service for 1,700 riders that currently must transfer to reach Sixth or Eighth Avenue destinations from Grand Concourse, Washington Heights and Central Park West local stations between 11AM and 2PM.
- o Effectively doubles off-peak service from Central Park West and Washington Heights express stations (168th Street to 59th Street) for 1,700 riders with Sixth Avenue destinations between 11AM and 2PM.
- o Provides direct off-peak service from Grand Concourse local stations for 700 riders with Eighth Avenue destinations between 11AM and 2PM.

Disadvantages:

- o Eliminates direct off-peak service from Grand Concourse local stations for 1,000 riders with Sixth Avenue destinations between 11AM and 2PM.
- o Provides a higher level of off-peak service to Grand Concourse and Central Park West stations than is warranted by identified demand.

Proposed Alternative

The preceding alternatives were reviewed to determine which produced the greatest benefit with the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes. The disadvantages associated with Alternatives #1, 3, 4, 5, 6, 7, 8, & 9 significantly outweigh the benefits achieved by the proposed changes in routes and services. Upon inspection, Alternative #2 provided the best combination of advantages and disadvantages. Under Alternative #2, operations would be as follows:

"A" (Eighth Avenue Local/Express during peak periods) remains unchanged except that it operates local off-peak between 59th Street-Columbus Circle and Chambers Street, World Trade Center, Manhattan.

- "AA" (Eighth Avenue Local) would be eliminated.
- "B" (Sixth Avenue Express) operates to 168th Street/Broadway, Manhattan, and Coney Island, Brooklyn, at all times except nights. At nights, the "B" shuttle operates between 36th Street-Fourth Avenue and Coney Island, Brooklyn.*
- "CC" (Eighth Avenue Local) remains unchanged.
- "D" (Sixth Avenue Express) remains unchanged. **

* Service to 57th Street/Sixth Avenue would be maintained by the "K" train (the "F" train at nights), as proposed in the Eastern Division Corridor section.

** "D" night service would be local on Sixth Avenue, as proposed in the Queens Boulevard-Astoria Corridor section.

Queens Boulevard-Astoria Corridors

Queens Boulevard Corridor

The Queens Boulevard Corridor is defined by the alignment of the Queens Boulevard Line between Queens Plaza and 179th Street-Jamaica. The line runs north from Queens Plaza Station as a four-track subway, with the express tracks running under Northern Boulevard to Broadway and an alternative local route running under Steinway Street and Broadway. All four tracks continue under Broadway, Queens Boulevard, Van Wyck Boulevard, and Hillside Avenue to a terminus at 179th Street. South of Queens Plaza Station, the line connects with the 53rd Street Tunnel to the Sixth and Eighth Avenue Lines in Manhattan, the 60th Street Tunnel to the Broadway Line in Manhattan, and the Crosstown Line to Downtown Brooklyn.

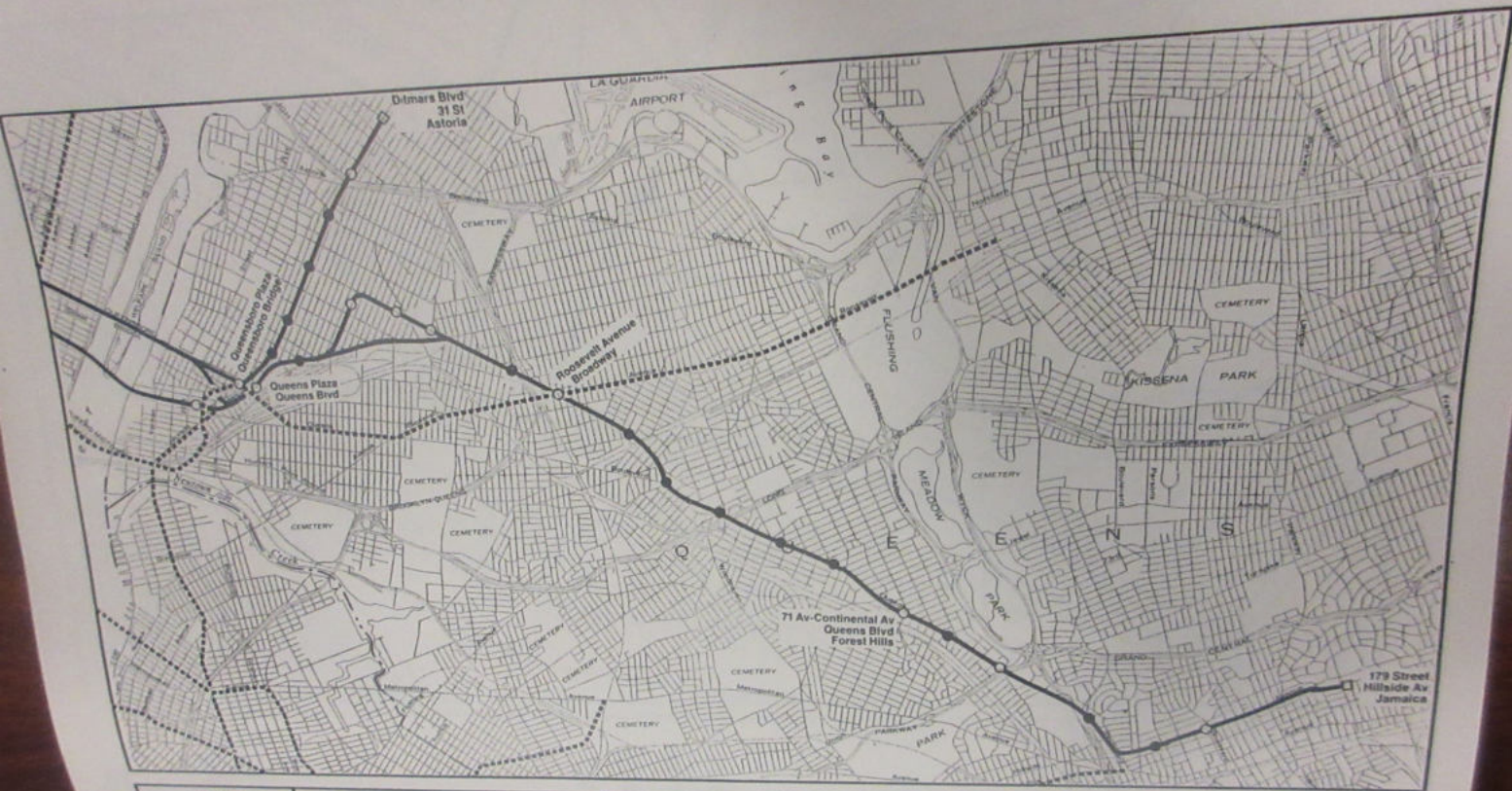
Land use in the western end of the corridor near Long Island City is predominantly industrial, typified by warehouses and light and heavy manufacturing, with some residential use. The remainder of the Queens Boulevard Corridor is typified by medium-density residential uses, with associated local commercial activity. Major commercial centers along the corridor include Queens Center and Macy's in Elmhurst, Alexanders in Rego Park, Forest Hills, Kew Gardens, the Steinway Street commercial area in Astoria, and downtown Jamaica.

Other generators of passenger traffic in the corridor include Lefrak City, adjacent to the Woodhaven Boulevard Station, City Hospital at Elmhurst Station, Queens Borough Hall and County Court House, at the Union Turnpike Station, and St. John's University, a half-mile from the 169th Street/Hillside Avenue Station. Both JFK and LaGuardia Airports can be reached from the Queens Boulevard Line via connecting bus services at Roosevelt Avenue Station and at Union Turnpike Station, respectively.

Current Service

Four routes currently use some or all of the Queens Boulevard Line: the "E", "F", "GG", and "N". Current operations of these routes is as follows:

- "E" (Eighth Avenue Local) operates between 179th Street/Hillside Avenue, Queens, and the World Trade Center, Manhattan, at all times. In Queens, the "E" operate express between Forest Hills and Queens Plaza at all times.
- "F" (Sixth Avenue Local) operates between 179th Street/Hillside Avenue, Queens, and Coney Island or Kings Highway, Brooklyn, at all times. In Queens, the "F" operates express between 179th Street/Hillside Avenue and Forest Hills during peak periods and between



Queens Boulevard-Astoria Corridors



FIGURE
21A



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Queens
Boulevard
-Astoria
Corridor



FIGURE
21B



New York City
Transit
Authority



Forest Hills and Queens Plaza at all times (except after 11PM, when the "F" runs local between 179th Street/Hillside Avenue and Queens Plaza).

"66" (Crosstown Line Local) operates between Forest Hills, Queens, and Smith-Ninth Streets, Brooklyn, daily until 11PM. At nights, the "66" operates only between Queens Plaza and Smith-Ninth Streets.

"N" (Broadway Express/Local during peak periods: Downtown-AM/Uptown-PM) operates between Forest Hills, Queens, and Coney Island, Brooklyn, Monday-Friday 6AM to 8PM. In Queens, the "N" operates local between Forest Hills and Queens Plaza. Evening and weekends, the "N" operates between 57th Street-Seventh Avenue, Manhattan, and Coney Island, Brooklyn, and at night operates only between 36th Street-Fourth Avenue and Coney Island, Brooklyn. Alternate peak period "N" service also operates between Whitehall Street, Manhattan, and Forest Hills, Queens: Downtown-AM, Uptown-PM

There are two major transfer stations between routes along the Queens Boulevard Line: Roosevelt Avenue and Queens Plaza. At Roosevelt Avenue, passengers can transfer between the Queens Boulevard Line services and the Flushing Line (#7) for service to Flushing or 42nd Street, Manhattan. At Queens Plaza, passengers can transfer between services to or from Sixth Avenue, Eighth Avenue, Crosstown and Broadway Lines ("E" and "F" passengers frequently use Fifth Avenue/53rd Street, Manhattan, to transfer between the "E" and "F" and Seventh Avenue/53rd Street, Manhattan, to transfer to IND services to Upper Manhattan and the Bronx).

Astoria Corridor

The Astoria Corridor is defined by the alignment of the Astoria Line between Queensboro Plaza and Ditmars Boulevard. From Queensboro Plaza Station, the line runs north as a three-track elevated facility above 31st Street, terminating at Ditmars Boulevard. West of Queensboro Plaza, the line connects with the 60th Street Tunnel to the Broadway Line in Manhattan.

Land use in the corridor is predominantly medium-density residential with associated local commercial activities. In addition, there is some light manufacturing and warehousing activity at the southern end of the corridor in Long Island City, and heavy manufacturing two blocks north of the line's terminus in Astoria-Steinway.

Current Service

Currently, the "RR" provides Astoria Line service. The "RR" (Broadway Local) operates between Astoria, Queens, and 95th Street/Fourth Avenue, Brooklyn, at all times. Astoria

Line passengers can transfer to the #7 at Queensboro Plaza for service to Flushing or 42nd Street, Manhattan. Transfers can also be made in Manhattan to the Lexington Avenue Line and the Seventh Avenue Line.

Demand Issues

Peak period demand from the Queens Boulevard and Astoria Corridors is presented on Tables 5 and 6, respectively.

TABLE 5
QUEENS BOULEVARD CORRIDOR PEAK DEMAND

DESTINATIONS	LOCAL STOPS	EXPRESS STOPS	TOTAL ALL STOPS
SIXTH AV	11.0% 4,785	20.0% 20,133	17.3% 24,918
EIGHTH AV	12.7% 5,493	20.1% 20,297	17.9% 25,790
53rd ST-MHTN	14.4% 6,269	17.3% 17,393	16.4% 23,662
BWY-MHTN (LOCAL)	7.5% 3,261	2.2% 2,271	3.8% 5,532
BWY-MHTN (EXPRESS)	30.8% 13,373	11.4% 11,461	17.2% 24,834
CROSSTOWN	0.6% 254	0.2% 217	0.3% 471
OTHER	22.9% 9,925	28.8% 28,980	27.0% 38,905
TOTAL	43,360	100,752	144,112

TABLE 6
ASTORIA CORRIDOR DEMAND

DESTINATION	PEAK DEMAND		OFF-PEAK DEMAND	
BWY-MHTN (EXPRESS)	30.4%	6,660	35.2%	1,105
BWY-MHTN (LOCAL)	20.9%	4,603	12.5%	393
* LEXINGTON AV*	23.3%	5,103	22.8%	714
SEVENTH AV*	3.9%	844	8.8%	275
SIXTH AV*	0.6%	142	0.4%	13
FLUSHING LINE	16.1%	3,523	9.8%	308
ASTORIA LINE	1.8%	394	6.6%	206
OTHER*	3.0%	650	3.9%	121
TOTAL		43,360		3,135

* Via a transfer at a Broadway Line express stop.

There is almost equally strong demand during peak periods for service to the Sixth Avenue Line (20.0 percent), Eighth Avenue Line (20.1 percent), and 53rd Street (17.3 percent) from express stations on the Queens Boulevard Line. This contrasts with the very strong demand for service to the Broadway Line



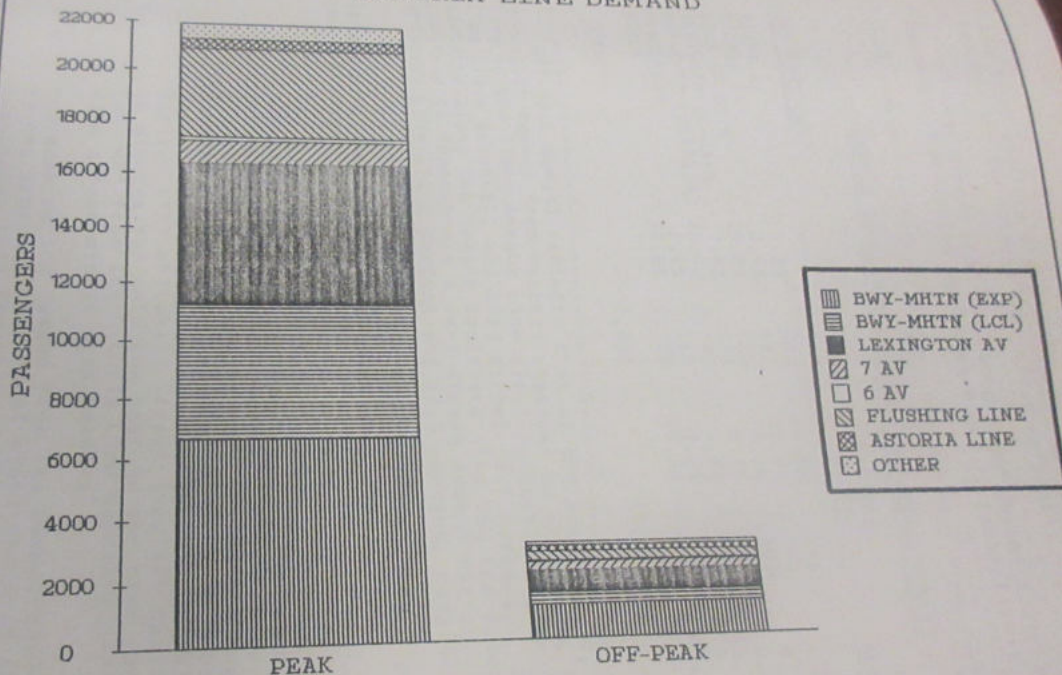
Passenger Demand

FIGURE
23



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ASTORIA LINE DEMAND



from local stations along the Queens Boulevard Line (38.3 percent) and the Astoria Line (51.3 percent).

Off-peak demand from the Astoria and Queens Boulevard Corridors is presented on Tables 6 and 7, respectively.

TABLE 7
QUEENS BOULEVARD CORRIDOR OFF-PEAK DEMAND

DESTINATIONS	LOCAL STOPS	EXPRESS STOPS	TOTAL ALL STOPS
SIXTH AV	7.2% 505	16.8% 2,596	13.8% 3,101
EIGHTH AV	8.4% 592	13.4% 2,063	11.8% 2,655
53rd ST-MHTN	10.2% 720	9.7% 1,502	9.9% 2,222
BWY-MHTN (LOCAL)	1.8% 128	0.1% 23	0.7% 151
BWY-MHTN (EXPRESS)	30.4% 2,136	9.9% 1,523	16.3% 3,659
CROSSTOWN	2.1% 150	1.3% 196	1.5% 346
OTHER	39.8% 2,799	48.7% 7,511	45.9% 10,310
TOTAL	7,030	15,414	22,444

Off-peak demand reflects that of the peak period, with the strongest demand from express stations on the Queens Boulevard Line to the Sixth Avenue Line (16.8 percent), Eighth Avenue Line (13.4 percent), and 53rd Street (9.7 percent). Local stations along the Queens Boulevard Line and the Astoria Line continue to demonstrate a very strong demand for service to the Broadway Line (32.2 percent and 51.3 percent, respectively).

Based on ridership data collected by the Study, demand issues were identified for these lines that warrant consideration:

- o The demand from the Astoria Line (and from the Flushing Line, via a transfer at Queensboro Plaza) to Broadway Line stations south of Canal Street is equivalent to the demand from the Queens Boulevard Line to those stops (see Table 8), even though direct Queens Boulevard Line service to those stations is limited ("M" Whitehall Street Specials operate every 10 minutes for only one hour in the peak period, while the "RR" from the Astoria Line operates continuously with a four-minute peak headway).
- o The peak period demand from the Queens Boulevard Line to the Broadway Line local stops north of Canal Street (excluding 49th Street/Seventh Avenue) is greater than the demand to those stops from the Astoria and Flushing lines combined (see Table 9), even though the majority of the service from the Queens Boulevard Line operates express on the Broadway Line.

TABLE 8
DEMAND TO BROADWAY LINE STOPS, SOUTH OF CANAL STREET

To Broadway Line South of Canal St	Demand from:		ASTORIA/ FLUSHING TOTAL	QUEENS BLVD LINE
	ASTORIA LINE	FLUSHING LINE		
(6AM-10AM)	2,089	1,416	3,505	3,338
(11AM-2PM)	159	124	283	106

TABLE 9
DEMAND TO BROADWAY LINE LOCAL STOPS, NORTH OF CANAL STREET*

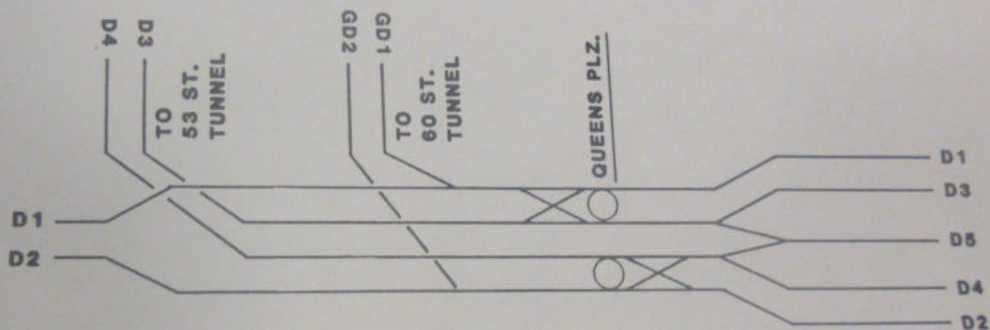
To Broadway Line North of Canal St	Demand from:		ASTORIA/ FLUSHING TOTAL	QUEENS BLVD LINE
	ASTORIA LINE	FLUSHING LINE		
(6AM-10AM)	1,281	1,120	2,410	2,970
(11AM-2PM)	105	183	288	57

* Excluding 49th Street/Seventh Avenue

- o The demand from the Astoria and Flushing Lines to 49th Street/Seventh Avenue is greater than the demand from the Queens Boulevard Line (see Table 10); this is understandable as Queens Boulevard Line riders can use the "F" to the nearby 47-50 Streets/Sixth Avenue station.

TABLE 10
DEMAND TO 49th STREET/SEVENTH AVENUE

To 49th Street:	Demand from:		ASTORIA/ FLUSHING TOTAL	QUEENS BLVD LINE
	ASTORIA LINE	FLUSHING LINE		
(6AM-10AM)	1,233	1,082	2,315	769
(11AM-2PM)	119	164	283	20



Fourth Street would significantly reduce the peak period capacity of both lines as trains would have to merge at West Fourth Street.

- o Due to track configuration, trains using the Manhattan Bridge should operate express on the Broadway Line and trains using the Montague Street Tunnel must operate local. Any other service configuration reduces Broadway Line capacity as trains would have to cross at the Prince Street interlocking, north of Canal Street.
- o The "E" may not be extended beyond its current southern terminal at the World Trade Center in order to maintain service reliability (this is further discussed in the Fulton Street Chapter).
- o Trains may not turn on active track (except at nights) as a delayed train can interfere with other train movements.

Two new rapid transit facilities are under construction in the corridor: the 63rd Street Tunnel and the Archer Avenue Subway. The Study does not address the route and service options for these facilities that are being analyzed separately. However, the Study's alternatives do not preclude any of the service options under review by the Authority for the new facilities.

Alternatives Analysis

Each demand issue for the Queens Boulevard and Astoria Corridors was analyzed to identify a number of route and service options, each addressing the problems associated with a particular demand issue and each with its own set of advantages and disadvantages. After preliminary review, the options for all demand issues were combined to create several alternatives for the Queens Boulevard and Astoria corridors. The proposed alternative is that combination of options that provides the greatest benefit with the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes.

Route and Service Options

The identified demand issues for the Queens Boulevard and Astoria Corridors were reviewed and analyzed to identify route and service options to address these problems.

Issue 1: The route structure is confusing, with a total of 13 different route variations providing service to or along the Queens Boulevard and Astoria Lines.

Option A: Eliminate "N" service variations, operating "N" consistently as a Broadway Express at all times.



Track Diagram

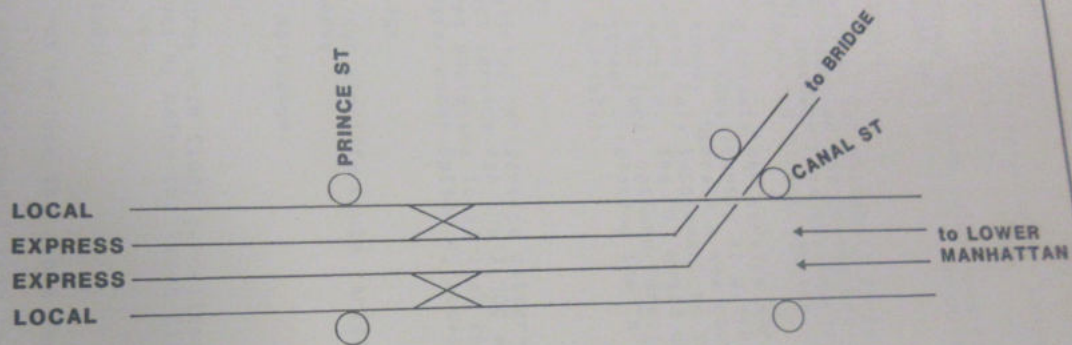


FIGURE
25



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BROADWAY LINE



Advantages:

- o Provides a simplified "N" service pattern that is less confusing than at present.
- o Conforms to Study guidelines for route and service changes to limit route variations for simplicity.

Disadvantages:

- o Eliminates "N" Whitehall Street Specials. 7,000 AM peak riders on the Queens Boulevard local line with local Broadway Line destinations that currently are provided with direct service would have to transfer.

Option B:

Eliminate "N" service variations, operating the "N" consistently as a Broadway Express at all times. Operate a new route, designated "V", as a peak only supplement to the "N" Broadway Express service. The "V" would operate as a Broadway Line local between Forest Hills and Whitehall Street (replacing the "N" Whitehall Street Specials).

Advantage:

- o Simplifies "N" service pattern while maintaining direct service for the 7,000 AM peak riders on the Queens Boulevard local line that would have to transfer under Option A, above.

Disadvantage:

- o Does not simplify route variations as much as Option A, above.

Option C: No change.

Advantage:

- o Conforms with Study guidelines for route and service changes by being the least disruptive of current services.

Disadvantage:

- o Does not relieve the above demand issue.

Issue II: The combined demand from the Astoria and Flushing Lines to Broadway Line stations south of Canal Street approximately equals the demand to those stops from the Queens Boulevard Line. Peak period demand from the Queens Boulevard Line to Broadway Line local stops north of Canal Street (excluding 49th Street/Seventh Avenue) is greater than the demand to those stops from the Astoria and Flushing Lines combined. Demand from the Astoria and Flushing Lines to

Broadway Line express stops is greater than the demand to those stops than the demand to those stops from the Queens Boulevard Line.

Option A:

Exchange the "N" and "RR" routings in Queens, operating the "N" to Astoria and the "RR" to Forest Hills; eliminate "N" service variations to conform with Study guidelines.

Advantages:

- o Provides a "N" and "RR" service pattern in Queens and Manhattan that is consistent with identified demand. 58,000 AM peak riders on the Queens Boulevard local and Astoria Lines with Broadway Line destinations currently have direct service on any train. With this proposal, 62,000 of these riders would have direct service on any train.
- o Reduces operating costs through the reduction of non-revenue car-miles by providing the "RR" with a permanent storage yard along its route (Jamaica Yard).

Disadvantages:

- o Requires riders between Astoria Line and Local Broadway line stations to transfer. Currently, 22,000 AM Peak riders on the Astoria Line with Broadway Line destinations have direct service. With this proposal, 3,000 of these riders would have to transfer.

Option B:

Switch the "N" and "RR" service patterns in Manhattan, operating the "N" as a Broadway express; eliminate "N" service variations to conform with Study guidelines.

Advantages:

- o Provides a "N" and "RR" service pattern in Queens and Manhattan that is consistent with identified demand. 58,000 AM peak riders on the Queens Boulevard local and Astoria Lines with Broadway Line destinations currently have direct service on any train. With this proposal, 62,000 of these riders would have direct service.

Disadvantages:

- o Requires Fourth Avenue (Brooklyn) Line riders that are currently provided with direct service to Lower Manhattan via the local Broadway Line to transfer. Study data (6AM to 2PM) shows that Fourth Avenue Line riders have a greater preference for Downtown Brooklyn and Lower Manhattan (10,300 riders) than do Sea Beach Line riders (5,300 riders) and would be disadvantaged by this alternative.

Option C:

Operate both the "N" and "RR" as Broadway locals in Manhattan; eliminate "N" service variations to conform with Study guidelines.

Advantages:

- o Provides a "N" and "RR" service pattern in Queens and Manhattan that provides direct service to Broadway Line destinations for the greater number of riders. Currently, 58,000 AM peak riders on the Queens Boulevard local and Astoria Lines with Broadway Line destinations have direct service on any train. With this proposal, 65,000 of these riders would have direct service on any train.

Disadvantages:

- o Capacity problems would develop in Brooklyn due to the necessity of merging "N", "RR" and "M" trains; may also over-tax the peak period capacity of the Montague Street Tunnel.
- o Adds seven minutes to travel time for the 13,500 AM peak riders currently using the "N" to Manhattan via the Manhattan Bridge.

Option D:

Operate the "RR" as a Broadway express in Manhattan, north of Canal Street, and as a Broadway local, south of Canal Street. Operate the "N" as a Broadway local, north of Canal Street, then via the Manhattan Bridge to Brooklyn.

Advantages:

- o Provides a "N" and "RR" service pattern in Queens and Manhattan that is consistent with identified demand. 58,000 AM peak riders on the Queens Boulevard local and Astoria Lines with Broadway Line destinations currently have direct service on any train. With this proposal, 63,000 of these riders would have direct service on any train.

Disadvantages:

- o Requires riders between Astoria Line and local Broadway Line stations, north of Canal Street, to transfer. Currently, 2,500 AM peak riders on the Astoria Line with local Broadway Line destinations, north of Canal Street have direct service. These passengers would have to transfer.
- o Reduces Broadway Line capacity as trains would have to cross north of Canal Street (this does not conform with current operating policy).

Option E:

Operate the "N" as a Broadway express in Manhattan, north of Canal Street, and as a Broadway local, south of Canal Street. Operate the "RR" as a Broadway local, north of Canal Street, then via the Manhattan Bridge to Brooklyn.

Advantages:

- o Provides a "N" and "RR" service pattern in Queens and Manhattan that is consistent with identified demand. 58,000 AM peak riders on the Queens Boulevard local and Astoria Lines with Broadway Line destinations currently have direct service on any train. With this proposal, 59,000 of the riders from these stations would have direct service on any train.

Disadvantages:

- o Requires riders between Astoria Line and Broadway Line stations, south of Canal Street, to transfer. Currently, 2,000 AM peak riders of the Astoria Line with Broadway Line destination, south of Canal Street, have direct service. These passengers would have to transfer.
- o Reduces Broadway Line capacity as trains would have to cross north of Canal Street (this does not conform with current operating policy).

Option F: No change.

Advantage:

- o Conform with Study guidelines for route and service changes by being the least disruptive of current services.

Disadvantage:

- o Does not relieve the above demand issue.

Issue III: The demand from the Astoria and Flushing Lines combined to 49th Street/Seventh Avenue is greater than the demand from the Queens Boulevard Line.

Option A: Stop Broadway express trains at 49th Street/Seventh Avenue.

Advantages:

- o Maintains direct service for 1,200 AM peak riders from the Astoria Line that would have to transfer if the Astoria Line becomes the Broadway express service.

- o Maintains one-transfer service for 100 AM peak riders from the Flushing Line that would have to transfer twice or use a circuitous route to reach 49th Street/Seventh Avenue if the Astoria Line becomes the Broadway express service.
- o Provides direct service for 800AM peak riders from the Queens Boulevard line that currently have to transfer, if the Queens Boulevard local continues as the Broadway express service.

Disadvantage:

- o Adds about a minute to the scheduled running time for the Broadway express service.

Option B: No change.

Advantage:

- o Conforms with Study guidelines for route and service changes by being least disruptive of current services.

Disadvantage:

- o Does not relieve the above demand issue.

Issue IV: The current Queens Boulevard local service during weeknights (8PM to 6AM), Saturdays and Sundays does not reflect identified demand and does not provide direct connections with the Lexington Avenue Line.

i. Evening (before Midnight)/Weekend Service.

Option A: Operate both the Broadway and Crosstown Line services to Forest Hills (71st-Continental Avenues) via the local Queens Boulevard Line during evenings (until 11PM, Saturdays and Sundays).

Advantages:

- o Provides direct service between the Broadway Line and the Queens Boulevard Line evenings, Saturdays and Sundays. Currently, 97 percent of riders traveling to or from Queens Boulevard Line local stations (10,000 riders during evenings, 60,000 on Saturdays and 35,000 on Sundays) must transfer to reach their destinations, 6,000 of these riders on weeknights, 34,000 riders on Saturdays and 29,000 riders on Sunday must transfer twice. As proposed only 7,000 weeknight riders, 42,000 Saturday riders and 24,000 Sunday riders would have to transfer once and virtually no riders would have to transfer twice.

- o Provides transfers between the Lexington Avenue Line and the Queens Boulevard Line at 59th Street/Lexington Avenue evenings, Saturdays and Sundays. Currently, 2,000 weeknight riders, 2,500 riders on Saturdays, and 7,500 riders on Sundays traveling to or from Queens Boulevard Line local stations must make two transfers and/or use a circuitous route to reach Lexington Avenue destinations.

- o Provides relief of evening and weekend overcrowding on the "GG" along the Queens Boulevard Line. Currently, early evening (8PM to 9PM) car loadings on the "GG" average 70 passengers/car. By providing an additional Queens Boulevard Line local service until 9PM, as proposed, the average car loadings of the combined service will be 35 passengers/car.

Disadvantages:

- o Provides a greater level of service to local Queens Boulevard stations during the late evening period than is warranted by RTTD traffic checks, reducing the cost-effectiveness of service in the late evening.

Option B: Operate the Broadway Line service to Forest Hills (71st-Continental Avenues) via the local Queens Boulevard Line, evenings (until 11PM), Saturdays and Sundays. Operate the Crosstown Line service to Forest Hills during periods of high ridership and terminate it at Queens Plaza at other times.

Advantages:

- o Provides direct service between the Broadway Line and the Queens Boulevard Line at evenings, Saturday and Sundays. Minimizes the need for passengers to transfer. Currently, 97 percent of riders traveling to or from Queens Boulevard line local stations--- 10,000 riders during weeknights (8PM to 6AM), 60,000 on Saturdays and 35,000 on Sundays---must transfer to reach their destinations; 6,000 of these riders on weeknights, 34,000 riders on Saturdays and 29,000 riders on Sunday must transfer twice. As proposed only 7,000 weeknight riders, 42,000 Saturday riders and 24,000 Sunday riders would have to transfer once and virtually no riders would have to transfer twice.
- o Provides transfers between the Lexington Avenue Line and the Queens Boulevard Line at 59th Street/Lexington Avenue evenings, Saturdays and Sundays. Currently, 2,000 weeknight riders, 2,500 riders on Saturdays, and 7,500 riders on Sundays traveling to or from Queens Boulevard Line local stations must make two transfer and/or use a circuitous route to reach Lexington Avenue destinations.

- o Provides relief of evening and weekend overcrowding on the "GG" along the Queens Boulevard Line. Currently, early evening (8PM to 9PM) car loadings on the "GG" average 70 passengers/car. By providing an additional Queens Boulevard Line local service until 9PM, as proposed, the average car loadings for the combined service will be reduced to 35 passengers/car.

Disadvantages:

- o Requires evening riders between the Crosstown Line and Queens Boulevard to transfer earlier than at present. Currently, the "GG" provides direct service to Forest Hills until about 11PM. As proposed, the "GG" will stop operating to Forest Hills at 9PM weeknights, 8PM Saturdays and 7PM Sundays. On weeknights between 9PM and 11PM, 120 riders currently provided with direct service would have to transfer at Queens Plaza to the "RR", "E" or "F".
- o Relays more trains at Queens Plaza earlier in the evening than at present, which requires "GG" trains to cross and merge with Queens Boulevard Line services.

Option C: No change.

Advantage:

- o Conforms with Study guidelines for route and service changes by being least disruptive of current services.

Disadvantages:

- o Does not relieve the above demand issue.

ii. Night Service (after 11PM) - Queens

Option A: Operate the Broadway Line service to Forest Hills (71st-Continental Avenues) via the local Queens Boulevard Line at night (assuming Broadway Line service is extended to Forest Hills during evenings, Saturdays and Sundays). Extend the hours of "F" express service to 179th Street/Hillside Avenue, Queens, until 1AM and terminate the "F" at 57th Street/Sixth Avenue between 1AM and 5AM, eliminating the "B" night shuttle to 57th Street/Sixth Avenue. Operate the "D" local along Sixth Avenue between 1AM and 5AM to maintain a Queens Boulevard connection.

Advantages:

- o Provides direct service between the Broadway Line and the Queens Boulevard Line at nights. Minimizes the need for passengers to transfer. Currently, 97 percent of riders traveling to or from Queens

Boulevard Line local stations---2,000 riders each night (11PM to 6AM)---must transfer to reach their destination; 1,000 of these riders must transfer twice. As proposed only 1,000 weeknight riders (1,500 Saturday and Sunday night riders) would have to transfer once and virtually no riders would have to transfer twice.

- o Provides transfers between the Lexington Avenue Line and the Queens Boulevard Line at 59th Street/Lexington Avenue at nights. Currently, 400 weeknight riders (500 riders on Saturday and Sunday nights) traveling to or from Queens Boulevard Line local stations must make two transfers and/or use a circuitous route to reach Lexington Avenue destinations.
- o Extends the hours of "F" express service to Forest Hills from 11PM to 1AM. 9,000 daily riders will have one additional service at nights, north of Queens Plaza. Combined express headways for the Queens Boulevard Line during this period will go from 12 to 6 minutes.
- o Eliminates the "B" Shuttle at nights to 57th Street/Sixth Avenue.

Disadvantages:

- o Requires 400 late night riders between the Sixth Avenue and Queens Boulevard Lines currently provided with direct service to transfer or use the "RR" at Broadway Line stations near the Sixth Avenue Lines.
- o Eliminates one service north of Forest Hills between 1AM and 5AM, doubling the effective service headways from 10 minutes to 20 minutes.

Option B:

Operate the Broadway Line service to 179th Street/Hillside Avenue via the local Queens Boulevard Line at night (assuming that Broadway Line service is extended to Forest Hills during evenings, Saturdays and Sundays). Extend the hours of "F" express service to 179th Street/Hillside Avenue until 1AM and terminate the "F" at 57th Street/Sixth Avenue between 1AM and 5AM, eliminating the "B" night shuttle to 57th Street/Sixth Avenue. Operate the "D" local along Sixth Avenue between 1AM and 5AM to maintain a Queens Boulevard Line connection.

Advantages:

- o Provides direct service between the Broadway Line and the Queens Boulevard Line at nights. Minimizes the need for passengers to transfer. Currently, 97 percent of riders traveling to or from Queens

Boulevard Line local stations---2,000 riders each night (11PM to 6AM)---must transfer to reach their destinations; 1,000 of these riders must transfer twice. As proposed only 1,000 weeknight riders (1,500 Saturday and Sunday night riders) would have to transfer once and virtually no riders would have to transfer twice.

- o Provides transfers between the Lexington Avenue Line and the Queens Boulevard Line at 59th Street/Lexington Avenue at nights. Currently, 400 weeknight riders (500 riders on Saturday and Sunday nights) traveling to or from Queens Boulevard Line local stations must make two transfers and/or use a circuitous route to reach Lexington Avenue destinations.
- o Extends the hours of "F" express service to Forest Hills from 11PM to 1AM. 9,000 daily riders will have one additional service at nights, north of Queens Plaza. Express headways during this period will go from 12 to 6 minutes.
- o Eliminates the "B" Shuttle at nights to 57th Street/Sixth Avenue.

Disadvantages:

- o Requires 400 late night riders between the Sixth Avenue and Queens Boulevard Lines currently provided with direct service to transfer or use the "RR".
- o Provides a greater level of service to the Queens Boulevard Line north of Forest Hills during nights than is warranted by RTTD traffic checks.

Option C: No change.

Advantage:

- o Conforms with Study guidelines for route and service changes by being least disruptive of current services.

Disadvantage:

- o Does not relieve the above demand issue.

iii Nights - Manhattan

Option A: Operate both the "N" and "RR" at nights through Manhattan and Brooklyn.

Advantages:

- o Provides two all-night services along the Broadway Line in Manhattan ("N" & "RR").

- o Provides through-service to Brooklyn Sea Beach Line ("N") stations at all times. Currently, 800 daily riders traveling to or from these stations at nights must use shuttle services and transfer. As proposed, direct service would be provided to these stations, possibly attracting additional late night ridership and improving passenger security.

Disadvantages:

- o Increases car miles operated at night.

Option B:

Operate one Broadway Line service night service along the Queens Boulevard Line, turning at 57th Street/Seventh Avenue, Manhattan (or at 34th Street/Broadway, to provide transfers to more services).

Advantage:

- o Conforms with Study guidelines for route and service changes by being least disruptive of current services.

Disadvantages:

- o Does not relieve the above demand issue.
- o Increases night car-miles operated if Queens service is operated (though not as much as Option A, above).

Option C: No change. *

Advantage:

- o Conforms with Study guidelines for route and service changes by being least disruptive of current services.

Disadvantages:

- o Does not relieve the above demand issue.

Proposed Alternative

The preceding options were reviewed to determine which combination of options would produced the greatest benefit with the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes. Upon inspection, the combination that provided the best combination of benefits and disbenefits would be as follow:

- "D" (Sixth Avenue Express) remains unchanged, except that it will operate local along Sixth Avenue, Manhattan, between 1AM and 5AM to maintain a Sixth Avenue connection for Queens Boulevard passengers.

- "E" (Eighth Avenue Local) remains unchanged.
- "F" (Sixth Avenue Local) remains unchanged, except that it will operate express between Queens Plaza and Forest Hills until 1AM, and will operate between 57th Street/Sixth Avenue, Manhattan, and Coney Island, Brooklyn, between 1AM and 5AM.
- "GG" (Crosstown Line) operates local between Forest Hills, Queens, and Smith-Ninth Streets, Brooklyn, weekdays 6AM to 9PM, Saturdays 7AM to 8PM, Sunday 10AM to 7PM. The "GG" operates between Queens Plaza and Smith-Ninth Streets at all times.
- "N" (Broadway Express) operates between Astoria, Queens, and Coney Island, Brooklyn, at all times (49th Street/Seventh Avenue, Manhattan, is added as an "N" stop on the Broadway Line).
- "RR" (Broadway Local) operates local between Forest Hills, Queens, and 95th Street/Fourth Avenue, Brooklyn, at all times. The "RR" operates extended local service between Forest Hills and 179th Street/Hillside Avenue, Queens, between 1AM and 5AM to replace the "F".
- "V" (Broadway Local) operates between Astoria, Queens, and Whitehall Street, Manhattan, during peak periods: Downtown-AM/Uptown-PM (replacing the current alternate peak period "N" service).

Flushing Corridor

The Flushing Corridor is defined by the alignment of the Flushing Line through Queens. The corridor begins at the Vernon-Jackson Avenues station, where the two-track line exits the Steinway Tunnel from 42nd Street, Manhattan, entering Queens beneath 50th Avenue. From Vernon-Jackson Avenues, the line runs below grade via 50th Avenue to a portal north of Hunters Point Avenue, then continues above grade via 23rd Street and private right-of-way to Queensboro Plaza. The elevated line broadens to three tracks past Queensboro Plaza, running over Queens Boulevard and Roosevelt Avenue until the east side of Flushing Meadows Park, where the line descends below grade and continues to a terminus beneath Roosevelt Avenue at Main Street, Flushing.

Land use in the corridor is predominately medium-density residential, with light and heavy industrial uses at the corridor's southern end (between Vernon-Jackson Avenues and 33rd Street). Commercial activity is centered around the 46th Street, 74th Street/Broadway, 82nd Street-Jackson Heights and Main Street-Flushing stations. Major generators in the corridor include Shea Stadium and Flushing Meadows Park.

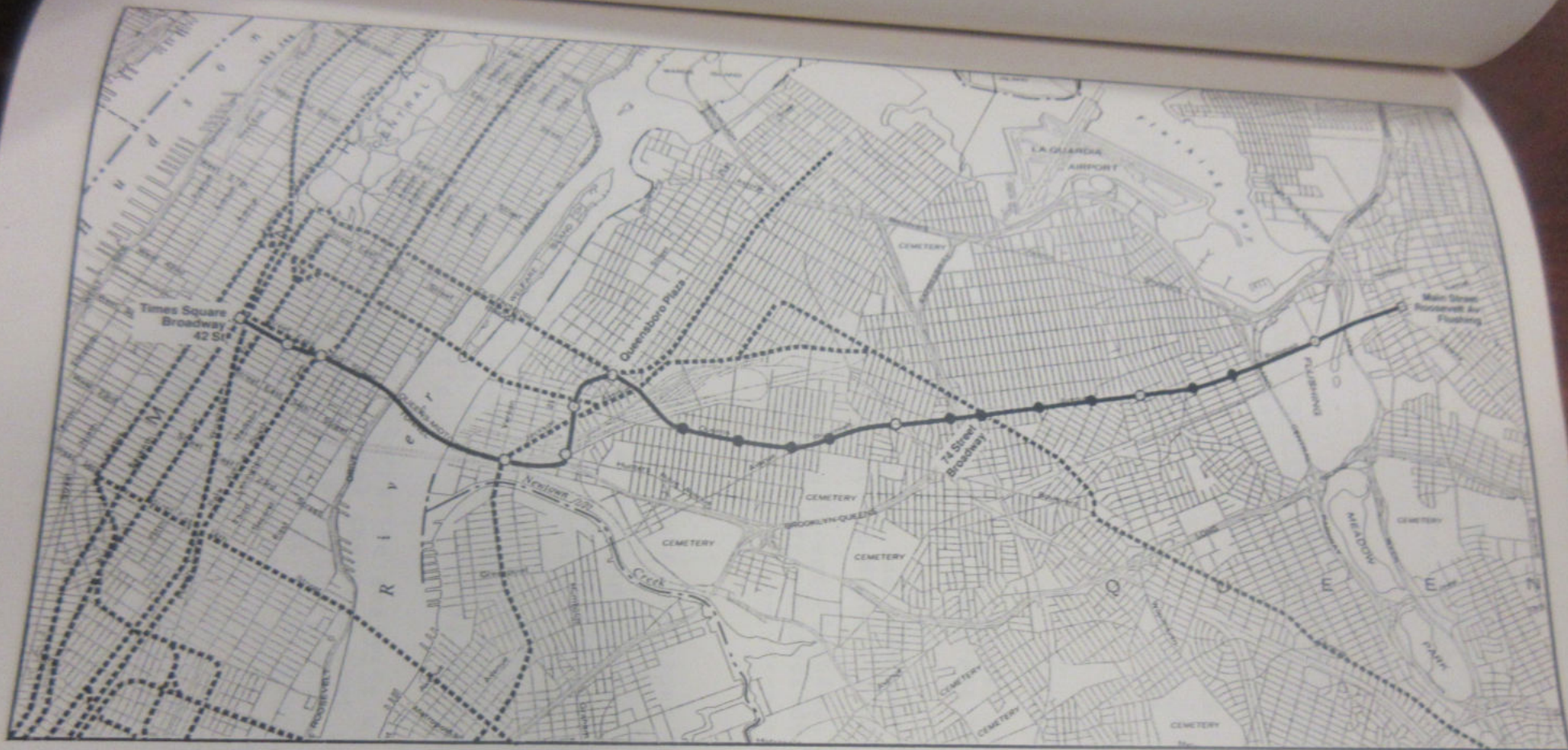
Current Service

The #7 (Flushing Local/Express) operates between Times Square, Manhattan, and Main Street-Flushing, Queens, at all times. During peak periods, express trains operate in the direction of peak traffic. Most express and local trains originate or terminate at Main Street-Flushing (some peak express trains use Willets Point and some peak local trains use 111th Street as terminals). The major transfer stations on the Flushing Line are 74th Street/Broadway and Queensboro Plaza. At 74th Street/Broadway, passengers can transfer between the local Flushing Line service and the Queens Boulevard Line services for the Sixth Avenue, Eighth Avenue, Crosstown and Broadway Lines ("E", "F", "GG", and "N", respectively). At Queensboro Plaza, passengers can transfer between the Flushing Line and the "RR" service to the Broadway Line in Manhattan or Astoria.

Demand Issues

During peak periods, there is strong demand for express service from Main Street-Flushing, Willets Point, Junction Boulevard, and 61st Street-Woodside Avenue, due in part to the feeder bus network at Main Street-Flushing. Of the total ridership between Main Street-Flushing and 33rd Street-Rawson Street, 54 percent (81,373 passengers) board at express stations and 46 percent board at local stations.

During the midday, there is both a sharp drop in overall ridership and in the proportion of passengers who benefit from express service. Between 11AM and 2PM, 14,573 passengers board between Main Street-Flushing and 33rd Street-Rawson Street. Of



Flushing Corridor



FIGURE
26



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these, 27 percent board at express stations and 73 percent board at local stations. Table 12 shows the demand pattern for the Flushing Line for the morning peak period and the midday period.

TABLE 12
DEMAND FROM FLUSHING LINE STATIONS

(Main Street-Flushing To 33rd Street-Rawson Street)*

	6AM-10AM	11AM-2PM
Total Boardings at Express Stops**:	46,802	4,765
Alightings at Local Stops:	- 3,120	- 793
Total Benefit by Express Service:	43,682	3,972
Total Boardings at Local Stops:	31,561	8,146
Transfers to IND at 74th Street:	- 3,010	- 1,672
Express Alightings at Local Stops:	- 3,120	- 793
Unable to Use Express Service:	37,691	10,601
6AM-10AM Riders Who Benefit from Express Service:		54%
11AM-2PM Riders Who Benefit from Express Service:		27%

- * Stations between Times Square and Queensboro Plaza are not included as express service to Manhattan is not an option at those stations.
- ** Express stops include Main Street-Flushing, Willets Point, Junction Boulevard and 61st Street-Woodside Avenue.

Alternative Analysis

The Flushing Line has no track connections to other A-Division (IRT) lines.* As a result, the #7 operates as a discrete service (i.e.: the #7 does not merge or share its tracks with any other service) and routing options are limited by the track and terminal configurations. The only stations on the line with terminal facilities are Times Square, Main Street-Flushing, Willets Point, and 111th Street. Since the line has three tracks between Queensboro Plaza and Main Street-Flushing, express service can only be operated in the peak direction of traffic.

The objective of the alternative analysis was to develop a combination of express and local services that decreased travel time for the maximum number of passengers without substantially increasing passenger waiting time at local stations or operating costs. Since the #7 currently operates local and express peak

* The #7 is restricted from operating on B-Division (BMT/IND) lines due to the equipment incompatibility.

services, the only alternative studied was to extend both services during the midday and early evening. To maintain an adequate level of midday service both services would operate on an eight-minute headway, instead of the current six-minute local headway. Due to the track configuration, an express service can only operate in the peak direction (Inbound-AM/Outbound-PM), providing service to all stations between Times Square and Queensboro Plaza, 61st Street-Woodside Avenue, Junction Boulevard, Willets Point, and Main Street-Flushing.

Advantages:

- o Express service would reduce travel time by three to eight minutes for 27 percent of the off-peak Flushing Line passengers.
- o Service at express stops on the Flushing Line would increase. Local headways in the off-peak direction would decrease.

Disadvantages:

- o 73 percent of the Flushing Line passengers could not use the express service.
- o 73 percent of the Flushing Line passengers would experience an increase in waiting time without benefitting from a travel time savings.
- o Operating costs would increase by providing a combined four-minute local and express service headway instead of the current six-minute local headway.
- o Boardings on the off-peak local service would be more than twice that of the express.

This alternative was not proposed for further consideration due to the relatively low demand for off-peak express service compared to the local service.

Eastern Division Corridors

The Eastern Division Corridors encompass three separate corridors: the Broadway-Brooklyn/Jamaica Avenue Corridor, the Myrtle Avenue Corridor, and the 14th Street/Canarsie Corridor. These corridors are defined by the alignment of their namesake lines through Brooklyn and Queens.

The Broadway-Brooklyn/Jamaica Avenue Corridor is defined by the alignment of the Broadway-Brooklyn and Jamaica Avenue Lines. The two-track line enters Brooklyn at Marcy Avenue via the Williamsburg Bridge, with connections in Manhattan to the Nassau Street Line and the Sixth Avenue Line. From Marcy Avenue Station, the line proceeds as a three-track elevated facility above Broadway-Brooklyn to Eastern Parkway. From Eastern Parkway, the line narrows to two tracks and continues above Fulton Street, Crescent Street, and Jamaica Avenue to its terminus at Queens Boulevard, Jamaica.

The Myrtle Avenue Corridor is defined by the alignment of the Myrtle Avenue Line. The two-track line diverges from the alignment of the Broadway-Brooklyn Line at Myrtle Avenue Station and proceeds as an elevated facility above Myrtle Avenue to terminate at grade at Metropolitan Avenue.

The 14th Street/Canarsie Corridor is defined by the alignment of the 14th Street and Canarsie Lines. The two-track line enters Brooklyn at Bedford Avenue via the 14th Street Tunnel from Manhattan. From Bedford Avenue Station, the line proceeds as a two-track subway beneath North 7th Street, Metropolitan Avenue, Bushwick Avenue, Harrison Place, Wyckoff Avenue and private right-of-way paralleling the ConRail Bay Ridge Line to Broadway Junction (adjacent to the Eastern Parkway Station on the Broadway-Brooklyn Line). The line climbs to above grade immediately prior to Broadway Junction and continues as a two-track elevated facility above Van Sinderen Avenue and private right-of-way paralleling the ConRail Bay Ridge Line to New Lots Avenue, then to a terminus at grade at Rockaway Parkway.

Land use in the Eastern Division Corridors is predominately medium-density residential. There are low-density residential uses along the Jamaica Avenue Line east of Eldert Lane Station. The 14th Street/Canarsie and Broadway-Brooklyn Lines serve areas of extensive light and heavy industrial activity in Williamsburg, at Eastern Parkway/Broadway Junction, and wherever the lines parallel the ConRail Bay Ridge Line.

Current Service

Three routes currently provide service to the Eastern Division Lines: the "J", "LL", and "M". The current operation of these routes is as follows:



Eastern Division Corridors



FIGURE
27A



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Eastern Division Corridor



FIGURE
27B



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- "J" (Nassau Street Local) operates between Broad Street, Manhattan, and Queens Boulevard, Queens, at all times. Peak "J" service operates express on Broadway-Brooklyn between Marcy Avenue and Myrtle Avenue in the direction of peak traffic.
- "LL" (14th Street Local) operates between Eighth Avenue/14th Street, Manhattan, and Rockaway Parkway-Canarsie, Brooklyn, at all times.
- "M" (Nassau Street Local) operates between Metropolitan Avenue, Queens, and Coney Island, Brooklyn, weekdays between 6AM and 9PM. At all other times, the "M" Shuttle operates between Metropolitan Avenue and Myrtle Avenue/Broadway-Brooklyn, Brooklyn.

Demand Issues

The Eastern Division Lines were divided into five segments for the purpose of analyzing alternative service routings. These segments were:

- BROADWAY-BROOKLYN: Broadway-Brooklyn Line between Marcy Avenue and Chauncey Street.
- JAMAICA AVENUE: Jamaica Avenue Avenue Line between Eastern Parkway and Queens Boulevard.
- MYRTLE AVENUE: Myrtle Avenue Line between Central Avenue and Metropolitan Avenue.
- 14TH STREET: 14th Street/Canarsie Line between Bedford Avenue and Bushwick Avenue.
- CANARSIE: 14th Street/Canarsie Line between Broadway Junction and Rockaway Parkway.

Analysis of the 14th Street segment was limited, as its track configuration limits alternative routing options.

Peak period demand from the Eastern Division segments is presented on the Table 13.

There is strong peak period demand for Lower Manhattan service from all the Eastern Division segments: from Myrtle Avenue, 59.9 percent (5,391 riders); from Jamaica Avenue, 42.9 percent (5,738 riders); from Broadway-Brooklyn, 24.1 percent (3,036 riders); and from Canarsie, 15.9 percent (1,950 riders). There is also strong demand for connections to the Lexington Avenue Line (6,101 riders) and for the Sixth Avenue Line. A lesser demand was recognized for the Eighth Avenue Line and for destinations within the Eastern Division.

TABLE 13
EASTERN DIVISION DEMAND
PEAK PERIOD (6AM TO 10AM)

DESTINATION SEGMENT	BWY-BKYN	MYRTLE AV	SEGMENT- JAMAICA AV	CANARSIE
SIXTH AV	14.7% 1,857	8.4% 750	10.8% 1,462	11.6% 1,420
EIGHTH AV	11.1% 1,403	2.1% 188	3.7% 507	8.0% 981
W 4TH ST	1.4% 173	1.0% 89	1.2% 162	0.7% 90
BWY-MHTN	6.7% 848	5.1% 462	5.2% 703	10.2% 1,248
14 ST-MHTN	0.5% 67	2.2% 197	2.6% 353	7.4% 911
SEVENTH AV	1.8% 231	0.3% 26	0.0% 0	1.1% 134
LEXINGTON	14.6% 1,836	11.0% 987	10.6% 1,434	15.0% 1,844
LOWER MHTN	24.1% 3,036	59.9% 5,391	42.4% 5,738	15.9% 1,950
DTOWN BKYN	2.2% 282	2.7% 246	3.2% 437	10.7% 1,317
14 ST-BKYN	0.0% 0	0.0% 0	1.6% 220	10.2% 1,248
MYRTLE AV	1.2% 155	1.3% 116	0.0% 0	0.0% 0
BWY-BKYN	3.4% 334	0.8% 76	3.4% 458	1.1% 134
JAMAICA AV	3.5% 440	0.0% 0	7.0% 953	1.5% 181
CANARSIE	1.9% 242	0.0% 0	0.9% 123	1.9% 234
OTHER	13.4% 1,691	5.3% 474	7.2% 971	4.8% 588
TOTAL	12,595	9,002	13,521	12,280

Off-peak demand from the Eastern Division segments reflects different trip-making patterns and is presented on Table 14.

TABLE 14
EASTERN DIVISION DEMAND
OFF-PEAK PERIOD (11AM TO 2PM)

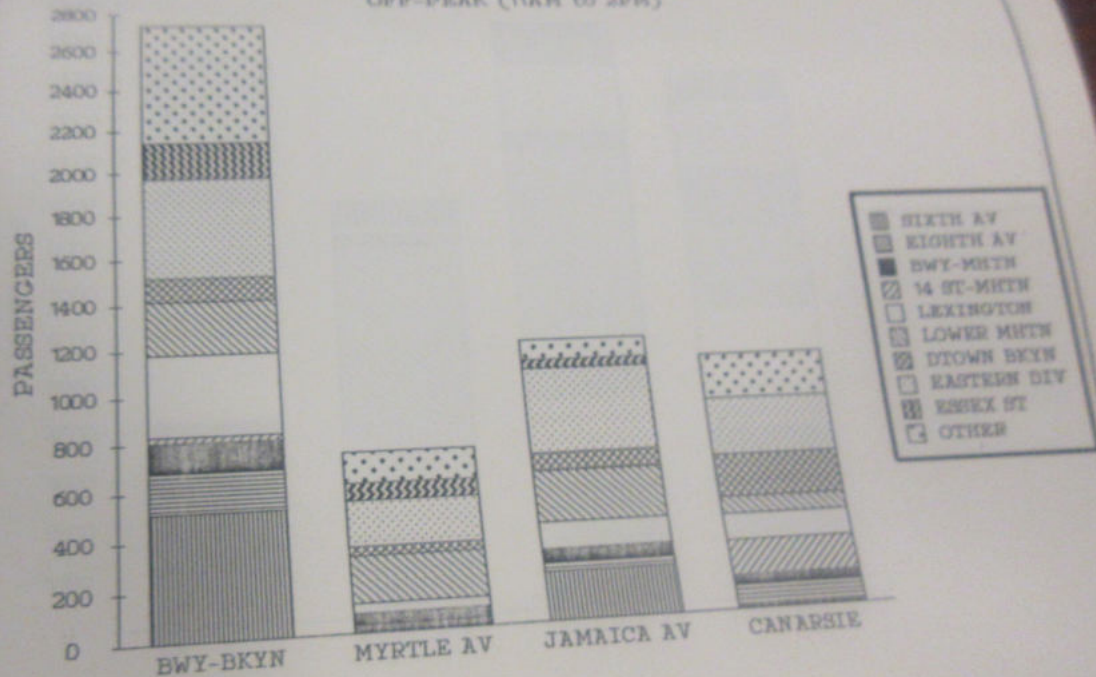
DESTINATION SEGMENT	BWY-BKYN	MYRTLE AV	SEGMENT- JAMAICA AV	CANARSIE
SIXTH AV	18.6% 511	1.6% 12	16.5% 197	0.8% 9
EIGHTH AV	6.3% 173	2.7% 20	2.8% 34	8.3% 92
W 4TH ST	0.0% 0	1.9% 14	1.0% 12	0.0% 0
BWY-MHTN	4.4% 120	6.0% 44	5.2% 62	3.1% 41
14 ST-MHTN	1.0% 24	0.0% 0	0.0% 0	13.1% 144
ESSEX ST	6.1% 167	10.0% 74	3.4% 41	0.0% 0
SEVENTH AV	2.3% 62	2.3% 17	0.5% 6	3.3% 36
LEXINGTON	12.8% 353	5.8% 43	9.4% 112	10.3% 114
LOWER MHTN	8.4% 230	25.0% 185	18.1% 216	6.5% 72
DTOWN BKYN	4.0% 109	5.8% 43	6.4% 77	16.8% 185
14 ST-BKYN	2.5% 70	3.1% 25	2.3% 28	13.5% 149
MYRTLE AV	3.3% 92	4.5% 33	5.7% 68	0.0% 0
BWY-BKYN	6.1% 166	14.2% 105	4.4% 53	2.3% 25
JAMAICA AV	4.6% 125	3.2% 24	17.7% 211	4.4% 48
CANARSIE	0.0% 0	0.0% 0	0.8% 10	2.2% 24
OTHER	19.6% 537	13.6% 100	5.8% 70	14.8% 164
TOTAL	2,739	739	1,194	1,103

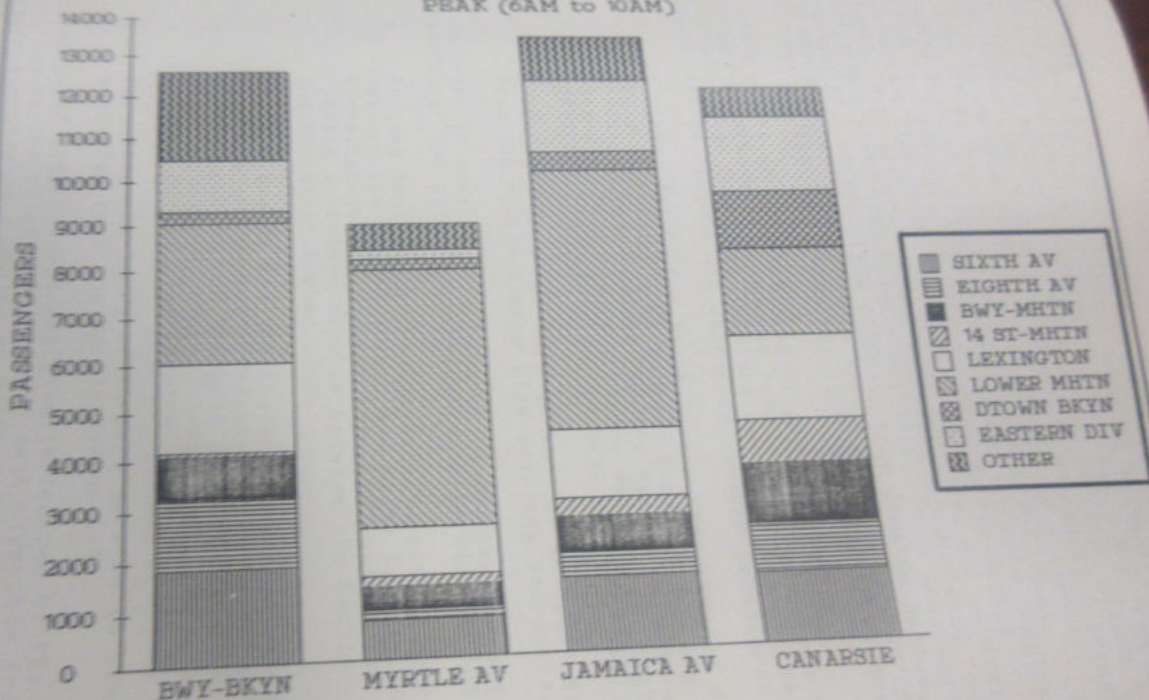


FIGURE



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EASTERN DIVISION DEMAND
OFF-PEAK (11AM to 2PM)



There is strong demand off-peak for Sixth Avenue Line service from two of the Eastern Division segments: from Broadway-Brooklyn, 18.6 percent (511 riders); and from Jamaica Avenue, 16.5 percent (197 riders). The off-peak demand for the Sixth Avenue Line is weaker from Myrtle Avenue (1.6 percent or 12 riders) and from Canarsie (0.8 percent or 9 riders). Demand is also strong for service to Lower Manhattan: from Broadway-Brooklyn, 8.4 percent (230 riders); from Jamaica Avenue, 18.1 percent (216 riders); and from Myrtle Avenue, 25.0 percent (185 riders); and from Canarsie, 6.5 percent (187 riders). Many off-peak riders indicated a preference for destinations within the Eastern Division: from Broadway-Brooklyn, 16.5 percent (453 riders); from Jamaica Avenue, 30.9 percent (317 riders); from Myrtle Avenue, 25.3 percent (187 riders); and from Canarsie, 22.4 percent (246 riders).

As a result of this analysis of peak and off-peak trip-making patterns, two demand issues were identified for the Eastern Division Corridors that are not addressed by the current service pattern and warranted further consideration:

- o A strong demand for Sixth Avenue Line service during the peak and off-peak periods from all Eastern Division Lines (except for the Myrtle Avenue and Canarsie Lines, where a strong demand for Sixth Avenue service is indicated during peak periods only).
- o A strong demand for through service to Lower Manhattan from the Myrtle Avenue Line evenings and weekends.

In order to develop alternatives to address these issues, consideration was given to the available service options:

- o Routing trains via the Chrystie Street Connection between the Nassau Street and Sixth Avenue Lines in Manhattan during peak or off-peak periods, in order to operate a through service between the Eastern Division and the Sixth Avenue Line.
- o Routing trains via the track connection between the Canarsie and Broadway-Brooklyn Lines in Brooklyn during peak and/or off-peak periods, in order to provide Canarsie Line passengers with an alternative to 14th Street Line service.
- o Extending the hours of through service to Lower Manhattan from the Myrtle Avenue Line.

The choice of alternatives was also influenced by the fact that, due to the relatively low off-peak ridership from the Eastern Division as a whole, no Eastern Division Line warranted more than a single off-peak service.

Concern focused on the existence of a viable market for a Sixth Avenue Line service in the Eastern Division. In 1968,

the Authority began to operate a service between 57th Street/Sixth Avenue and 168th Street (the end of the Jamaica Avenue Line at that time), designated the "KK." In late 1972, this service (renamed "K") was reduced to a peak-only service to Eastern Parkway and was entirely discontinued in 1976, due to low ridership. Brooklyn Community Board #18 (Canarsie) requested that the Study investigate a new "K" service, originating at Rockaway Parkway, however, instead of Eastern Parkway.

Table 15 compares the peak and off-peak demand for Sixth Avenue Line service relative to the current Manhattan service of each of the Eastern Division Lines: i.e.: the Nassau Street Line for Broadway-Brooklyn, Myrtle Avenue and Jamaica Avenue and the 14th Street Line for Canarsie. As previously noted, analysis of the 14th Street segment was limited, so it does not appear on Table 15.

TABLE 15
EASTERN DIVISION DEMAND

SEGMENTS*	-----DEMAND FOR MANHATTAN SERVICE VIA-----		INDIFFERENT	
	CURRENT ROUTE	SIXTH AVENUE		
PEAK (6AM to 10AM)				
BROADWAY-BROOKLYN	44.3% 5,507	34.4% 3,890	21.3%	2,399
CANARSIE	28.9% 3,460	29.2% 3,504	41.9%	5,015
JAMAICA AVENUE	52.0% 6,574	16.6% 2,096	31.4%	3,970
MYRTLE AVENUE	67.0% 6,230	16.3% 1,515	16.7%	1,551
OFF-PEAK* (11AM to 2PM)				
BROADWAY-BROOKLYN (Marcy Av to Myrtle Av)	39.6% 646	37.7% 614	22.7%	370
JAMAICA AVENUE (Koskiusko St to Queens Blvd)	31.3% 546	27.4% 479	41.3%	720
MYRTLE AVENUE (Central Av to Metropolitan Av)	48.5% 393	20.7% 168	30.8%	249

* The peak and off-peak segments differ as Canarsie is not a routing option for off-peak Sixth Avenue service. Due to the track configuration of Broadway Junction (Figure 31), 14th Street Line trains from Manhattan can only operate Canarsie Line service. Off-peak 14th Street Line service must be maintained and a second off-peak service operating to Canarsie ridership is not warranted by identified demand (1,104 Canarsie Line riders, 11AM to 2PM).



Track Diagram

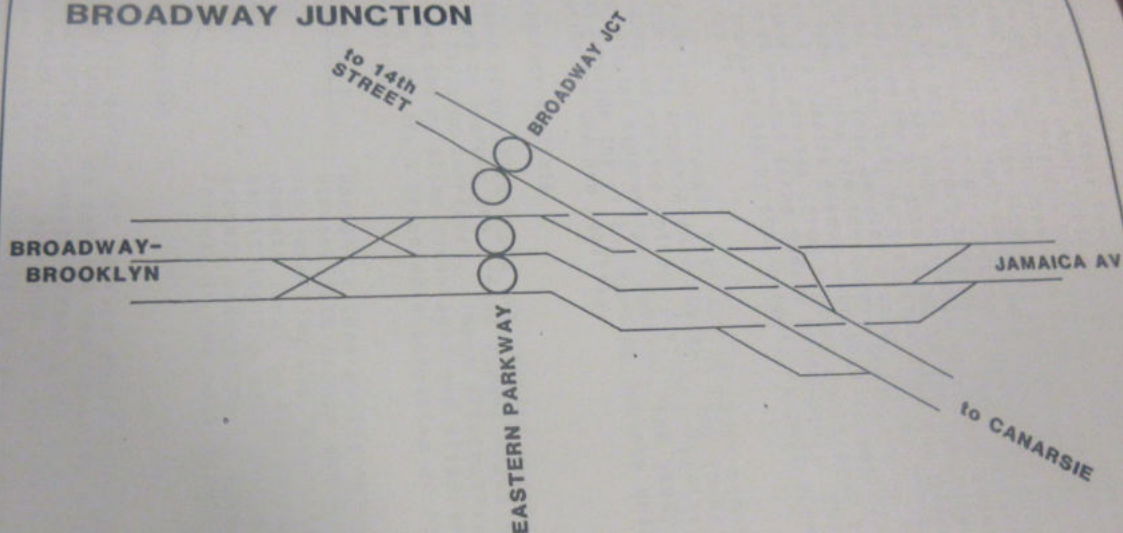


FIGURE
30



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EASTERN DIVISION BROADWAY JUNCTION



NOTE: Yard leads are not shown.

To further assess the viability of "K" service, passenger diversion from other rapid transit lines was analyzed. A review of Brighton Line and Nostrand Avenue Line was reviewed for "K" services from Canarsie and from Jamaica Avenue. This review suggested that passengers tend to enter the system at the most convenient (usually, the closest) station to their origin, without regard for which station could provide the most direct service to their destination. For a "K" from Canarsie (6AM to 10AM), about 126 passengers would be diverted from the Brighton Line to the Canarsie Line. There would be essentially no diversion from the Queens Boulevard Line to a "K" from Jamaica Avenue, as the "F" service to the Sixth Avenue Line via the Queens Boulevard is faster than a "K" service via Jamaica Avenue---to 34th Street/Sixth Avenue: the "F" takes 35 minutes (from Parsons Boulevard) vs. the "K" taking 48 minutes (from Queens Boulevard). This analysis has been substantiated by the Authority's past operating experience with the "K."

A new rapid transit facility is under construction in the corridor: the Archer Avenue Subway. The Study does not address the route and service options for this facility, as they are being analyzed separately. However, the Study's alternatives do not preclude any of the service options under review by the Authority for the new facility.

Alternatives Analysis

Seven alternative route and service change proposals were developed to address the demand issues identified for the Eastern Division Corridors. These alternatives were analyzed to assess the relative advantages and disadvantages of each in order to identify a proposed alternative or combination of alternatives.

Alternative 1:

Operate a peak period "K" between 57th Street/Sixth Avenue and Rockaway Parkway, supplementing the "LL." The "K" would operate local on the Broadway-Brooklyn Line permitting the peak period "J" to operate express between Marcy Avenue and Eastern Parkway in the peak direction of traffic.

Discussion:

The peak period "K" service would provide an alternative to 14th Street Line service for Canarsie riders and an alternative to Nassau Street Line service for Broadway-Brooklyn riders. Both the "K" and the "LL" would provide peak service to Rockaway Parkway. However, due to capacity limitations resulting from the configuration of tracks into Canarsie Yard, some peak "LL" trains (about five per peak period) would operate between Eighth Avenue/14th Street and Atlantic Avenue. Although there would be fewer peak "LL" trains operating to Rockaway Parkway, the net result of this proposal is to increase the overall number of trains on the Canarsie segment between Atlantic Avenue and Rockaway Parkway. The combined levels of peak period "K" and "LL" service proposed is sufficient to accommodate the demand generated by this segment.



Track Diagram

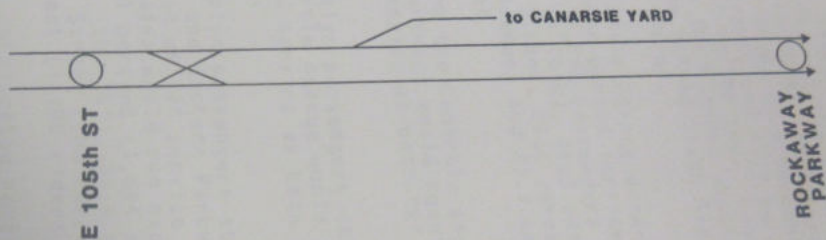


FIGURE
31



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CANARSIE LINE



Advantages:

- o There is strong demand from Canarsie for peak period service to the Sixth Avenue Line, matching that of the existing service. Of the 11,797 passengers from Canarsie (6AM to 10AM), 28.9 percent (3,504 riders) prefer Sixth Avenue, 28.9 percent (3,460 riders) prefer 14th Street, and 41.9 percent (5,015 riders) are indifferent to the two. Canarsie has the highest proportion and the highest absolute number of riders preferring peak period Sixth Avenue Line service for the Eastern Division.
- o There is moderately strong demand from Broadway-Brooklyn for peak period service to the Sixth Avenue Line. Of the 11,296 passengers from Broadway-Brooklyn (6AM to 10AM), 44.3 percent (5,007 riders) prefer Nassau Street, 34.4 percent (3,890 riders) prefer Sixth Avenue, and 21.3 percent (2,399 riders) are indifferent.
- o Passengers from the Canarsie segment (Atlantic Avenue to Rockaway Parkway) would receive a net increase in peak period service as both "K" and "LL" trains would operate.
- o Broadway-Brooklyn passengers at stations between Marcy Avenue and Myrtle Avenue would receive a net increase in peak period service as both "K" and "M" trains would operate.
- o Broadway-Brooklyn passengers at local stations between Myrtle Avenue and Eastern Parkway would receive "K" service instead of "J" service during the peak period, as all "J" trains would run express. At these local stations, 38.1 percent (1,694 riders) prefer Sixth Avenue (i.e.: the "K"), 36.9 percent (1,639 riders) prefer Nassau Street (the current "J" & "M" routing), and 25.0 percent (1,109 riders) are indifferent.
- o The currently complicated route structure for the Sixth Avenue Line in Manhattan would be simplified. With the "K" providing service to 57th Street/Sixth Avenue, all "B" service could operate express along Sixth Avenue and Central Park West to 168th Street (as proposed elsewhere in this report). This would result in two Sixth Avenue services consistently operating local ("F" and "K") and two services consistently operating express ("B" and "D").

Disadvantages:

- o The "K" and "LL" would stop at different platforms at Eastern Parkway/Broadway Junction. Similarly, the "K" and "F" would stop at different platforms at Essex Street/Delancey Streets. In both cases, this will

inconvenience passengers who are indifferent to which service they use. This inconvenience, however, would be offset by improved service reliability for these indifferent passengers, as a service delay on one route would not affect service on the other route.

Peak period "J" and "LL" headways would increase to reflect passenger diversion to the "K". About 3,409 peak "J" riders from Broadway-Brooklyn (Marcy Avenue and between Myrtle Avenue and Eastern Parkway) and 3,504 peak "LL" riders from Canarsie (between Atlantic Avenue and Rockaway Parkway) would be diverted to the "K". This estimate used RTSSS origin-destination data and assumed that passengers would divert either to the most direct service or, if passengers were indifferent between services, to the first service available. This reduced demand for the "J" and "LL" service would be reflected in increased headways, as shown on Table 16.

TABLE 16
PROPOSED CHANGES IN "J" & "LL" PEAK HEADWAYS

ROUTE	SEGMENT	----HEADWAY IN MINUTES----	
		PRESENT	PROPOSED*
"J"	Broadway-Brooklyn	5	6
"K"	Broadway-Brooklyn/Canarsie	--	6.6
"LL"	14th Street	5	6
"LL"	Canarsie	5	7.5

* Proposed headways are approximate. Actual headways would be set by the Rapid Transit Transportation Department as part of the schedule-making process.

From the passenger's perspective, the increase in "J" headways would be offset by the reduction in "J" running time by operating express between Marcy Avenue and Eastern Parkway (saving about two minutes)--the one-minute headway increase would only increase the expected waiting time by a half-minute. The combined peak headway of the "K" and "LL" at Canarsie would be considerably shorter than the current peak headway of the "LL" alone.

278 peak passengers travelling between Jamaica Avenue stations and local Broadway-Brooklyn stations, currently provided with direct service, would have to transfer at Eastern Parkway.

- o The "K" to Canarsie is not a feasible off-peak service, due to the need to terminate the off-peak "LL" at Canarsie (as previously discussed in detail). As such, the "K" to Canarsie must either operate as a peak-only service or terminate elsewhere during the off-peak---which is not desirable from the standpoint of providing consistent peak/off-peak service patterns.

Alternative 1a:

The same as Alternative 1, above, but the "K" would operate express on Broadway-Brooklyn and the "J" would operate local (or alternately, express between Marcy Avenue and Myrtle Avenue only, as at present). The option of operating the "K" express on Sixth Avenue was also considered.

Discussion:

- o If the "K" operated express on Broadway-Brooklyn, local stations would only be provided with Nassau Street line service, as at present. With the "K" operating local, local stations between Marcy Avenue and Myrtle Avenue would benefit from having both Sixth Avenue ("K") and Nassau Street ("M") service. In addition, as any off-peak "K" service would have to operate local, operating the peak "K" local provides a consistent peak/off-peak service pattern.
- o A further problem complicating any proposal to operate a "K" express on Broadway-Brooklyn relates to the track configuration at Broadway Junction. The interlocking plant connecting the Broadway-Brooklyn and Canarsie Lines is arranged such that northbound "K" from the Canarsie Line would first have to merge with Broadway-Brooklyn Line local traffic before it could crossover to the express track. Any "K" express would have to cross in front of (or wait for) a "J" local, which could hamper peak period service reliability. However, if the "K" was local, a "J" express has the opportunity to crossover to the express track prior to the merge point with the "K" local, eliminating any conflicting movements.
- o Operating the "K" as a Sixth Avenue Line express is undesirable since the current operation precludes the addition of a third Sixth Avenue express service. If the "K" were made one of the two Sixth Avenue express services, track configurations dictate that the northbound "K" must first merge with the other express service south of West Fourth Street, then either merge again with the local service north of 47-50th Street/Sixth Avenue in order to reach 57th Street/Sixth Avenue or continue to Upper Manhattan via the Central Park West Line. The multiple mergers are not advisable from an operational standpoint and a "K" to Upper Manhattan is not warranted by identified demand.

Alternative 2:

Operate a peak period "K" between 57th Street/Sixth Avenue and Queens Boulevard ("J"), supplementing the "J". The "K" would operate local on the Broadway-Brooklyn Line. The peak period "J" would operate express between Marcy Avenue and Eastern Parkway in the peak direction of traffic.

Discussion:

The peak period "K" service would provide an alternative to Nassau Street Line service for Broadway-Brooklyn Line riders, as in Alternative 1, and for Jamaica Avenue Line riders. Both "J" and the "K" would provide peak service to Jamaica Avenue, alternating service to provide a combined peak headway of approximately five minutes.

Advantages:

- o There is moderate demand from Jamaica Avenue for a peak period service to the Sixth Avenue Line. Of the 12,626 passengers from Jamaica Avenue (6AM to 10AM), 16.6 percent (2,096 riders) prefer Sixth Avenue, 68.7 percent (8,670 riders) prefer Nassau Street, and 14.7 percent (1,860 riders) are indifferent.
- o There is moderate demand from Broadway-Brooklyn for peak period service to the Sixth Avenue Line. Of the 11,296 passengers from Broadway-Brooklyn (6AM to 10AM), 44.3 percent (5,007 riders) prefer Nassau Street, 34.4 percent (3,890 riders) prefer Sixth Avenue, and 21.3 percent (2,399 riders) are indifferent.
- o Alternating "J" and "K" trains would provide Sixth Avenue Line service to the Eastern Division Corridors while maintaining the current frequency of peak period service on all lines.
- o The "K" to Jamaica Avenue is a feasible off-peak service. As such, this alternative could be paired with an alternative providing off-peak "K" service to Jamaica Avenue (Alternative 4) to provide a consistent peak/off-peak service pattern.

Disadvantages:

- o Peak period headways would double for direct service between the Nassau Street and Jamaica Avenue Lines. This would disbenefit 68.7 percent (8,670 riders) of the peak passengers from Jamaica Avenue.

Alternative 3:

Operate a peak period "K" between 57th Street/Sixth Avenue and Metropolitan Avenue, replacing the peak period "M". The "K" would operate local on Broadway-Brooklyn.

Advantages:

- o There is some demand from Myrtle Avenue for peak period service to the Sixth Avenue Line. Of the 9,294 passengers from Myrtle Avenue (6AM to 10AM), 16.3 percent (1,515 riders) prefer Sixth Avenue, 67.0 percent (6,227 riders) prefer Nassau Street, and 16.7 percent (1,552 riders) are indifferent.
- o A simple, consistent service pattern could result by operating the "K" on Myrtle Avenue at all times (except nights, when a "K" Shuttle between Metropolitan Avenue and Myrtle Avenue Stations would operate) and the current "J" and "LL" service patterns would be maintained.

Disadvantages:

- o There is a stronger demand from Myrtle Avenue for peak period service to the Nassau Street Line. Under this alternative, 67.0 percent (6,227 riders) of the peak riders, currently provided with direct service to Nassau Street, would have to transfer.

Alternative 4:

Operate an off-peak "K" between 57th Street/Sixth Avenue and Queens Boulevard, replacing the "J" (except nights). Extend the hours for "M" through-service to Manhattan.

Discussion:

The off-peak "K" would operate local on Broadway-Brooklyn and Jamaica Avenue at all times (except nights). The "J" would be retained only for service during peak periods and after midnight. The "M" service would be extended to Broad Street, Manhattan, evenings and on weekends.

Advantages:

- o There is moderate demand from Broadway-Brooklyn stations between Marcy Avenue and Myrtle Avenue for an off-peak service to the Sixth Avenue Line equalling that of the existing service. Of the 1,630 passengers from Broadway-Brooklyn (11AM to 2PM), 41.0 percent (668 riders) prefer Nassau Street, 37.7 percent (614 riders) prefer Sixth Avenue, and 21.3 percent (348 riders) are indifferent. Under this alternative, half the off-peak Broadway-Brooklyn service would be oriented towards Sixth Avenue and half would be oriented towards Nassau Street.
- o There is moderate demand from Broadway-Brooklyn and Jamaica Avenue stations between Kosciusko Street and Queens Boulevard for an off-peak service to the Sixth

Avenue Line, matching that of the existing service. Of the 1,745 passengers from these stations (11AM to 2PM), 30.0 percent (524 riders) prefer Nassau Street, 27.5 percent (479 riders) prefer Sixth Avenue, and 42.5 percent (742 riders) are indifferent.

- o Transfers between the "K" to Sixth Avenue and the "M" to Nassau Street are simplified as both services use the same platform at Essex Street. This would replace the current, more difficult transfer that requires Eastern Division passengers to change levels to use the "F" at Delancey Street for Sixth Avenue Line service.
- o Provides direct service between Myrtle Avenue and Manhattan at all times (except nights). 1,700 weekday evening riders that currently must transfer will be provided direct service.
- o The currently complicated route structure for the Sixth Avenue Line in Manhattan would be simplified. With the "K" providing service to 57th Street/Sixth Avenue, all off-peak "B" service could operate to 168th Street (as proposed elsewhere in this report).

Disadvantages:

- o The "K" is somewhat duplicative of the "F" service at outer stations on the Jamaica Avenue Line near the Queens Boulevard Line.
- o Eliminates direct off-peak service between the Nassau Street Line and the Broadway-Brooklyn/Jamaica Avenue Line stations between Kosciuszko Street and Queens Boulevard. This is partially mitigated by the easier, same-platform transfer at Essex Street previously mentioned.
- o The proposed service pattern for the "J" is more complicated than at present.

Alternative 5: Operate an off-peak "K" between 57th Street/Sixth Avenue and Metropolitan Avenue, replacing the "M".

Advantages:

- o There is moderate demand from Myrtle Avenue for off-peak service to the Sixth Avenue Line. Of the 810 passengers from Myrtle Avenue (11AM to 2PM), 48.5 percent (393 riders) prefer Nassau Street, 20.7 percent (168 riders) prefer Sixth Avenue, and 30.8 percent (249 riders) are indifferent.
- o A simple, consistent service pattern could result, as discussed in Alternative 3.

Disadvantages:

- o There is a stronger demand from Myrtle Avenue for off-peak service to the Nassau Street Line. Under this alternative, 48.5 percent (393 riders) of the off-peak riders, currently provided with direct service to Nassau Street, would have to transfer.

Alternative 6:

Operate the "M" between Broad Street, Manhattan, and Metropolitan Avenue at all times (with service extended to Brooklyn, as at present). The "J" Shuttle would operate at night between Myrtle Avenue and Queens Boulevard.

Advantages:

- o Through-service between Manhattan and Myrtle Avenue would be provided at all times, providing direct service for passengers that currently must transfer.

Disadvantages:

- o The majority of "J" riders at night, currently provided with direct service to Manhattan, must transfer. This is partially mitigated by the fact that "J" Shuttle riders have a greater number of services available for transfers ("A", "LL" or "M") compared to the current "M" Shuttle riders.
- o More passengers use the Broadway-Brooklyn/Jamaica Avenue Line at night than use the Myrtle Avenue Line.

Alternative 7:

Operate the peak period "M" express on Broadway-Brooklyn and operate the "J" as a local at all times.

Advantages:

- o Travel times would be reduced by about two minutes for 98.0 percent (8,800 riders) of the Myrtle Avenue Line passengers between 6AM and 10AM.

Disadvantages:

- o Track configuration at Myrtle Avenue Interlocking dictates that the "M" express would have to cross in front of (or wait for) the local "J". This is operationally undesirable and could affect service reliability.
- o The "J" route to Manhattan via Broadway-Brooklyn/Jamaica Avenue is considerably longer than the "M" route to Manhattan via Myrtle Avenue. Therefore, fewer passengers with a shorter trip would benefit from the time saved by running the "M" express.

Proposed Alternatives

The preceding alternatives were reviewed to determine which produced the greatest benefit with the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes. Among the alternatives relating to peak period service (Alternatives #1, 1a, 2, 3 & 7), the disadvantages associated with Alternatives #1a, 2, 3 & 7 significantly outweigh the benefits achieved by the proposed changes in routes and services. Likewise, among the alternatives relating to off-peak service (Alternatives #4, 5 & 6), the disadvantages associated with Alternatives #5 & 6 significantly outweigh the benefits achieved. Upon inspection, a combination of Alternatives #1 and #4 was proposed for further consideration. Under this proposal, service to the Eastern Division Corridors would operate as follows:

- "J" (Nassau Street Local) operates between Broad Street, Manhattan, and Queens Boulevard, Queens, only during peak periods and nights. Peak "J" service operates express on Broadway-Brooklyn between Marcy Avenue and Eastern Parkway in the direction of peak traffic.
- "K" (Sixth Avenue Local) operates between 57th Street/Sixth Avenue, Manhattan, and Rockaway Parkway-Canarsie Brooklyn, during peak periods. The "K" operates between 57th Street/Sixth Avenue and Queens Boulevard, Queens, at all other times (except nights).
- "LL" (14th Street Local) remains unchanged, except that some peak period trains will originate or terminate at Atlantic Avenue, Brooklyn.
- "M" (Nassau Street Local) operates between Metropolitan Avenue, Queens, and Coney Island, Brooklyn, during peak periods and middays. The "M" operates between Metropolitan Avenue and Broad Street, Manhattan, evenings and weekends. The "M" Shuttle remains unchanged at nights.

Fulton Street-Rockaways Corridor

The Fulton Street-Rockaways Corridor is defined by the alignment of the Fulton Street and Rockaway Lines through Brooklyn and Queens to Lefferts Boulevard, Rockaway Park and Far Rockaway Stations. The corridor begins at Jay Street Station, where the IND Sixth and Eighth Avenue Lines from Manhattan merge. The Fulton Street Line runs south from Jay Street as a two-track rapid transit facility beneath Smith Street and Schermerhorn Street. At Hoyt-Schermerhorn Station, the line is joined by a two-track subway line from the former IND Court Street Station, now out of service and used for the NYCTA Transit Museum. The line continues south as a four-track facility beneath Schermerhorn Street, Lafayette Avenue, Fulton Street, Pennsylvania Avenue and Pitkin Avenue to Euclid Avenue. The line narrows to two tracks beyond Euclid Avenue and climbs above grade at Grant Avenue. It runs elevated above Liberty Avenue to Lefferts Boulevard, with a single additional center track that permits Lefferts Boulevard trains to bypass 104th Street and 111th Street.

The two-track Rockaway Line branches off the Fulton Street Line south of Rockaway Boulevard, then broadens to four tracks; a single additional track is provided as part of the Fulton Street Line that permits Rockaway Line trains to bypass Boyd Street and Rockaway Boulevard. The line runs south from Rockaway Boulevard at grade via private right-of-way across Jamaica Bay. The line narrows to two tracks south of Howard Beach and splits into two branches on the Rockaway Peninsula: one running elevated via private right-of-way to Rockaway Park and another elevated over the Rockaway Freeway to Far Rockaway.

Land use in the corridor is predominantly residential, with densities ranging from low-density residential neighborhoods in Queens to medium-density residential neighborhoods in Bedford-Stuyvesant. There is industrial activity in East New York and also scattered along Atlantic Avenue, which closely parallels the Fulton Street Line. Commercial areas are located at Nostrand Avenue, including the Restoration Plaza Centre, and at the three outer terminals (Lefferts Boulevard, Far Rockaway, Rockaway Park). In addition, Downtown Brooklyn, a major commercial center, is located at the northern end of the corridor.

Other sources of passenger traffic within the Fulton Street-Rockaways Corridor include Aqueduct Race Track, which has its own seasonally-used station, John F. Kennedy Airport, reached by the Q-10 bus from Lefferts Boulevard or the JFK Express Bus from Howard Beach, the Airport's Cargo Area reached by the Q-7 bus from Euclid Avenue, and the beach areas of the Rockaway Peninsula.



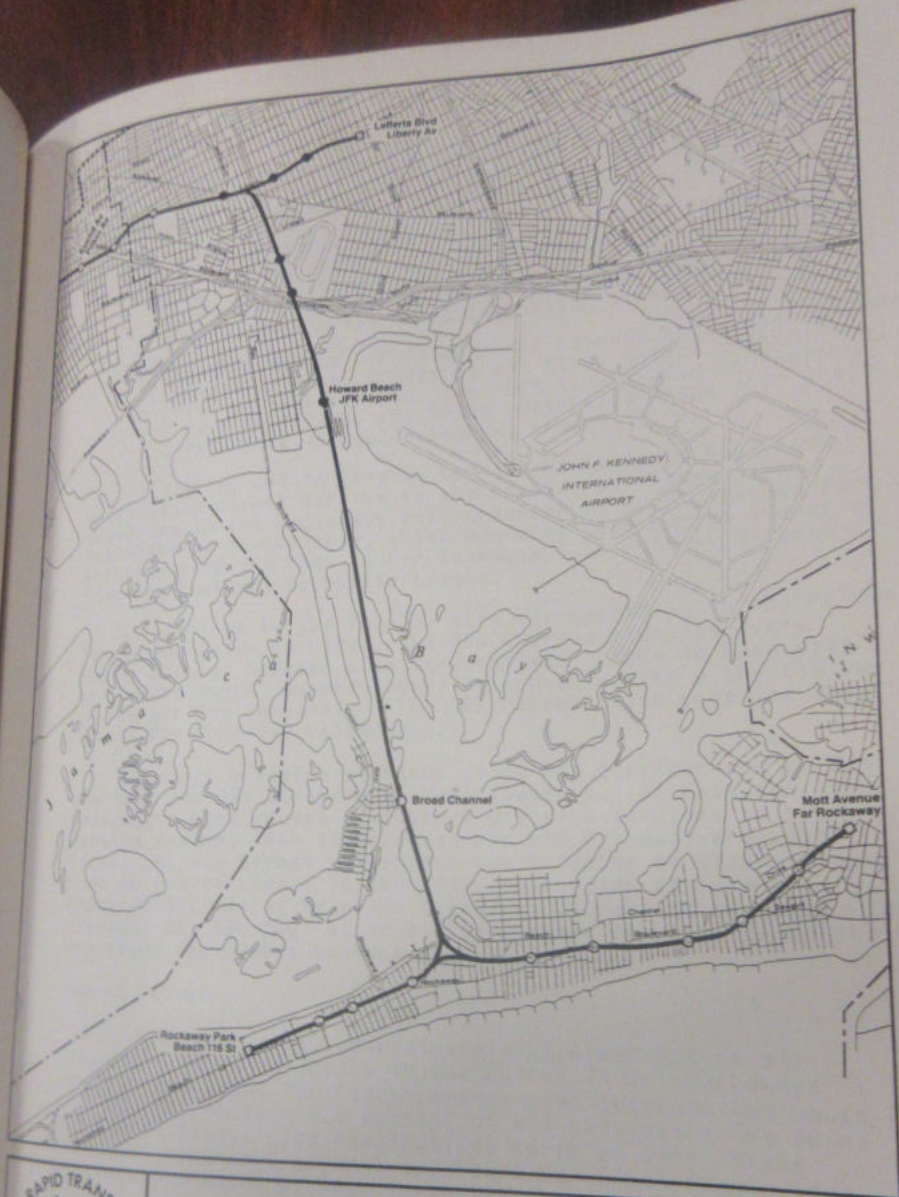
Fulton Street Corridor



FIGURE
32A



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Fulton Street Corridor



FIGURE
32B



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Current Service

Two routes currently provide service to the Fulton Street-Rockaway Lines: the "A" and "CC". The current operation of these routes is as follows:

"A" (Eighth Avenue Express) operates between 207th Street/Broadway, Manhattan, and alternately either Lefferts Boulevard, Queens, or Far Rockaway, Queens, at all times except nights. In Brooklyn, the peak period "A" operates express along the Fulton Street Line.

"CC" (Eighth Avenue Local) operates between Broad Channel and Rockaway Park, Queens at all times except nights. During peak periods, the "CC" is extended to Bedford Park Boulevard, the Bronx (alternate Bronx "CC" trains terminate at Euclid Avenue, Brooklyn).

At nights, all "A" trains operate to Lefferts Boulevard, eliminating direct service to the Rockaways. Passengers traveling to the Rockaways must transfer at Euclid Avenue for the Rockaway Round-Robin, which operates from Euclid Avenue to Rockaway Park and then to Far Rockaway. It returns directly from Far Rockaway to Euclid Avenue.

In addition to the regular services operating in the Fulton Street-Rockaways Corridor, the JFK Express operates every twenty minutes between 57th Street/Sixth Avenue in Manhattan and Howard Beach, Queens, where it connects with a shuttle bus to the airline terminals. The JFK Express also stops at Jay Street for Brooklyn passengers.

The major transfer stations along the corridor are at East New York and Jay Street-Boro Hall stations. At East New York, passengers have access to Eastern Division services on the Jamaica Avenue, 14th Street/Canarsie and Broadway-Brooklyn Lines. At Jay Street passengers can transfer to Sixth Avenue Line or Culver Line. In addition, passengers can use the Franklin Shuttle at Franklin Avenue for access to Brighton Line services and the "GG" at Hoyt-Schermerhorn for service to the Crosstown and Queens Boulevard Lines.

Demand Issues

During peak hours, approximately 22.6 percent of all passengers boarding trains in the Fulton Street-Rockaways Corridor are bound for Eighth Avenue Line destinations south of 14th Street. Another 8.5 percent of all passengers are bound for Eighth Avenue Line destinations north of 14th Street (Midtown), and 16.2 percent are bound for Sixth Avenue Line destinations north of 14th Street (Midtown). These demand figures are significant when considering how to route Fulton Street Line services through Manhattan---although demand is stronger for Midtown service via the Sixth Avenue Line versus the Eighth Avenue Line, the strongest demand is for Lower Manhattan service.

During the off-peak, approximately 12.4 percent of the passengers are bound for Eighth Avenue Line destinations south of 14th Street, 8.5 percent are bound for Eighth Avenue Line Midtown destination, and 32.3 percent are bound for Fulton Street-Rockaways Corridor destinations in Brooklyn. Only 6.1 percent are bound for Sixth Avenue Line Midtown destinations. Peak hour and off-peak demand is presented on Table 17.

TABLE 17
FULTON STREET-ROCKAWAYS CORRIDOR DEMAND

DESTINATION	PEAK DEMAND		OFF-PEAK DEMAND	
SIXTH AV	16.2%	8,154	6.1%	411
EIGHTH AV-MIDTOWN	8.5%	4,277	8.5%	574
EIGHTH AV-L. MHTN	22.6%	11,383	12.4%	834
CENTRAL PARK WEST	4.0%	2,012	6.3%	426
LEXINGTON AV	13.5%	6,799	11.5%	776
FULTON ST LINE	11.2%	5,635	27.1%	1,759
ROCKAWAYS BRANCH	0.5%	248	4.2%	274
LEFFERTS BRANCH	0.1%	81	1.0%	67
53rd ST & QUEENS	2.6%	1,320	2.6%	177
SEVENTH AVENUE	2.5%	1,283	1.6%	107
BRIGHTON/Frk SS	0.8%	407	2.6%	179
HOUSTON-ESSEX	0.8%	427	1.6%	108
EASTERN DIV/NASSAU	4.0%	1,993	4.9%	329
CULVER/SOUTHERN DIV	1.2%	582	4.9%	329
OTHER	2.6%	1,325	2.0%	132
TOTAL		45,926		6,482

Three demand issues were identified regarding the peak period service in the Fulton Street-Rockaways Corridor:

- o The demand for Sixth Avenue Line service to Midtown is greater than demand for Eighth Avenue Line Midtown service, even though all current service operates via the Eighth Avenue Line.
- o "A" express trains carry significantly heavier loads than "CC" local trains based on RTTD Traffic Checks.
- o The "CC" and "A" routes are duplicative for most of their routes.

In addition, a review of RTTD Traffic Checks indicate that the Cranberry Street Tunnel between Lower Manhattan and Brooklyn (used by the "A") has the highest ridership and the least frequent service of all the East River crossings between Brooklyn and Lower Manhattan during the off-peak.



Passenger Demand

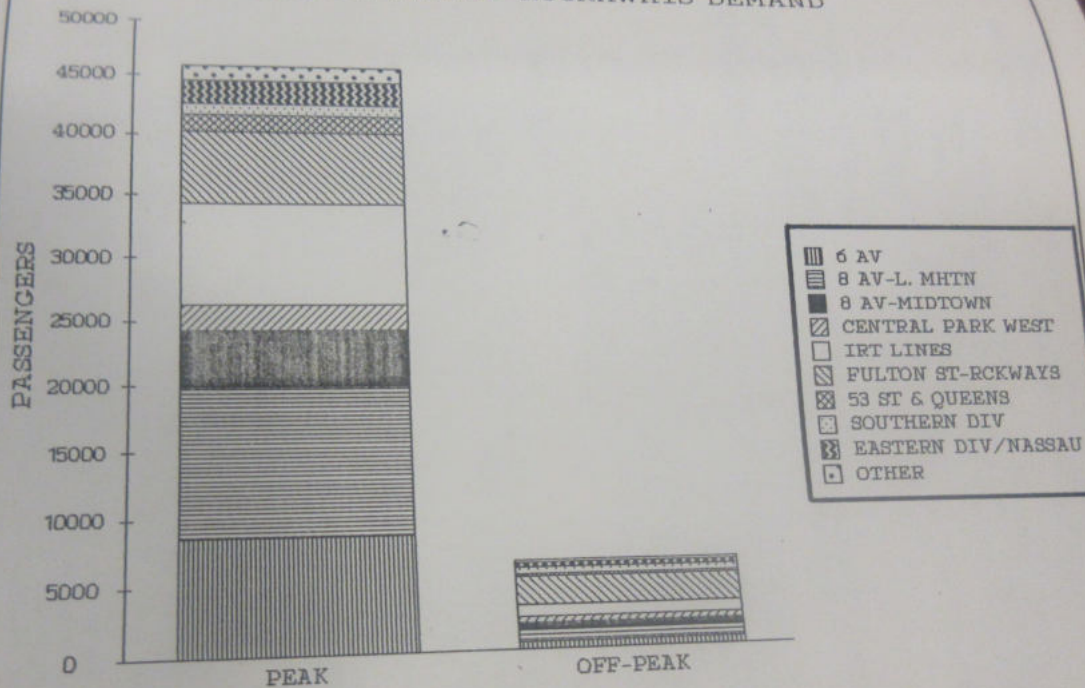
FIGURE

33



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FULTON STREET-ROCKAWAYS DEMAND



Alternatives developed to address these issues must also conform with the following operating and policy constraints:

- o Movements between the Sixth and Eighth Avenue Lines at West Fourth Street are discouraged as peak period congestion could result from the mergers required.
- o Trains may not turn on active line track (except nights).

Alternatives Analysis

In order to address the demand issues, the following service alternatives were developed and reviewed:

Alternative 1:

Replace the "CC" with a peak period "H" service, operating between 57th Street/ Sixth Avenue, Manhattan, and Rockaway Park, Queens (alternate "H" trains would terminate at Euclid Avenue, Brooklyn, as the "CC" does currently). In Manhattan, the "H" operates via the Eighth Avenue Line to West Fourth Street, then via the Sixth Avenue Line through Midtown.

Advantages:

- o Provides Fulton Street-Rockaways Corridor with a direct service to the two areas of the highest demand: the Eighth Avenue Line in Lower Manhattan and the Sixth Avenue Line in Midtown. 8,154 riders from these stations between 6AM and 10AM that currently must transfer to reach Sixth Avenue would have direct service.
- o Express ("A") and local ("H") train loadings in the corridor would be better balanced as the "H" does not serve the same stations as the "A", which is the case with the current "CC" service.

Disadvantages:

- o Delays could result from merging the "H" at West Fourth Street with two Sixth Avenue local services.
- o Eighth Avenue Line express service would be eliminated during peak periods as the "A" would have to operate local in Midtown to maintain direct service between Eighth Avenue Line local stops in Midtown and Central Park West stops north of 50th Street.
- o Grand Concourse express service would be eliminated without the "CC" service operating peak service to Upper Manhattan and the Bronx. In addition, there would be only one local service along Central Park West (the "B"), resulting in overcrowding and reduced service reliability.

Alternative 2:

Operate the peak period "CC" between Bedford Park Boulevard, the Bronx, and the World Trade Center, Manhattan. Extend the peak period "E" to Rockaway Park, Queens (with alternate "E" trains terminating at Euclid Avenue, Brooklyn). Either the "E" or the "A" would operate express in Brooklyn.

Advantages:

- o The "E" would provide direct service to the 53rd Street and the Queens Boulevard Line for 2.6 percent (1,320) of the peak period Fulton Street-Rockaways Corridor passengers.
- o The "A" and the "E" are not duplicative north of 50th Street/Eighth Avenue.
- o The "E" would provide direct service between the Queens Boulevard Line and Broadway-Nassau.

Disadvantages:

- o The longer "E" route may be less reliable as it requires more merging than the current "E" service. This concern is based on prior operating experience with the "E" to the Rockaways.

Alternative 3: Extend the off-peak "E" to Hoyt-Schermerhorn, Brooklyn (except nights).

Advantages:

- o The level of off-peak service operating through the Cranberry Street Tunnel between Chambers Street/World Trade Center and Hoyt-Schermerhorn would be doubled.

Disadvantages:

- o Only a limited number of Fulton Street-Rockaways Corridor passengers would benefit (passengers at Broadway-Nassau, High Street, Jay Street, and Hoyt-Schermerhorn).
- o A delayed "E" train relaying at Lafayette Avenue could affect JFK Express reliability.
- o There are no crew facilities at Hoyt-Schermerhorn.

Alternative 4:

Replace the "AA" with an off-peak "CC" between either 168th Street/Broadway, Manhattan, or Bedford Park Boulevard (or 167th Street/Grand Concourse), the Bronx, and Rockaway Park, Queens. Operate the off-peak "A" express in Brooklyn.

Advantages:

- o The level of off-peak service operating through the Cranberry Street Tunnel between Chambers Street/World Trade Center and the Fulton Street-Rockaways Corridor would be doubled.
- o The off-peak "CC" permits operating off-peak "A" express service on the Fulton Street Line.

Disadvantages:

- o An all-day operation with R-10 cars (current "CC" rolling stock) would be relatively unreliable. Cars in peak period "D" service could be used in midday to supply the "CC", but the possible loss of "D" cars due to failures and delays could result in a shortage of cars to supply the evening peak train requirement for the "D".

Proposed Alternatives

The preceding alternatives were reviewed to determine which produced the greatest benefit with the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes. Alternatives #1, 2 & 4 are operationally undesirable and the disadvantages associated with Alternative #3 outweigh the benefits achieved by the proposed change. As a result, no alternative was proposed for further consideration.

IRT Brooklyn Corridor

The IRT Brooklyn Corridor is a Y-Shaped corridor defined by the alignment of the A-Division (IRT) Lines through Brooklyn to New Lots Avenue and Flatbush Avenue. The corridor begins at Borough Hall Station, where the Clark Street Line and the Lexington Avenue Line from Manhattan merge*. The New Lots Line runs south from Borough Hall as a four-track rapid transit facility beneath Fulton Street, Flatbush Avenue and Eastern Parkway to Franklin Avenue station. At Franklin Avenue, the two-track Nostrand Avenue Line branches off south beneath Nostrand Avenue to a terminal at Flatbush Avenue. The four-track New Lots Line continues beneath Eastern Parkway to Utica Avenue. South of Utica Avenue, the New Lots Line becomes to a two-track elevated over East 98th Street and Livonia Avenue to a terminus at New Lots Avenue.

The north end of the corridor encompasses the Brooklyn Central Business District. Land use in the remainder of the corridor is predominantly medium-density residential, with commercial activity in the vicinity of Flatbush and Utica Avenues station and light manufacturing in the vicinity of Atlantic Avenue and Junius Street stations. The corridor borders Prospect Park and contains the Brooklyn Museum, Brooklyn Botanic Gardens, Kings County Hospital/SUNY Downstate Medical Center and Brooklyn College.

Current Service**

Four routes currently provide service to the New Lots and Nostrand Avenue Lines: the #2, #3, #4, and #5. The current operation of these routes is as follows:

- #2 (Seventh Avenue Express) operates between 241st Street/White Plains Road, the Bronx, and New Lots Avenue, Brooklyn, at all times.
- #3 (Seventh Avenue Express) operates between 148th Street/Lenox Terminal, Manhattan, and Flatbush Avenue, Brooklyn, at all times (except nights).
- #4 (Lexington Avenue Express) operates between Woodlawn, the Bronx, and Atlantic Avenue, Brooklyn, at all times. During peak periods, Sunday mornings, and nights, the #4 is extended to Flatbush Avenue, Brooklyn, and during evening, Saturdays, and Sundays, the #4 is extended to Utica Avenue, Brooklyn.

* The physical merger of the Clark Street and Lexington Avenue Lines actually occurs at Nevins Street Interlocking. This analysis used Borough Hall as the merge point, however, since both lines serve part of that station.

** Service pattern prior to July 1983. Service has since been changed.



IRT
Brooklyn
Corridor



FIGURE

34



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#5 (Lexington Avenue Express) operates between Dyre Avenue, the Bronx, and Bowling Green, Manhattan, at all times (except nights). During peak periods, the #5 is extended to Utica Avenue, Brooklyn, and during weekdays between 9AM and 3PM, the #5 is extended to Atlantic Avenue, Brooklyn Line.

The current service pattern* is complicated, with four different service patterns each day: one for peak periods, one for weekdays, one for evenings and weekends, and one for nights and Sunday mornings. During peak periods at Utica Avenue, for example, there is Seventh Avenue Line (#2) and Lexington Avenue Line (#5) service, but during middays there is only Seventh Avenue Line (#2) service, during evenings there is Seventh Avenue Line (#2) and a different Lexington Avenue Line (#4) service, and at nights only Seventh Avenue Line (#2) service. Table 18 shows the daily service pattern at IRT Brooklyn Corridor stations and Table 19 shows the routing for each service during each time period.

TABLE 18
IRT BROOKLYN CORRIDOR SERVICE*
SERVICE BY STATION

STATION	PEAK				WEEKDAY 9AM-3PM				WEEKEND & EVENING				NIGHTS, SUNDAY MORNING			
	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Borough Hall	X	X	X	X	X	X	X	X	X	X	X		X		X	
Hoyt St	X	X			X	X			X	X			X			
Nevins St	X	X	X	X	X	X	X	X	X	X	X		X		X	
Atlantic Av	X	X	X	X	X	X	X	X	X	X	X		X		X	
Bergen St	X	X			X	X			X	X			X		X	
Grand Army Plz	X	X			X	X			X	X			X		X	
Eastern Pky	X	X			X	X			X	X			X		X	
Franklin Av	X	X	X	X	X	X			X	X	X		X		X	
Mostrand Av	X				X				X				X			
Kingston Av	X				X				X				X			
Utica Av	X		X		X				X				X			
Sutter Av									X				X			
to New Lots Av	X				X				X				X			
President St																
to Flatbush Av	X		X		X				X						X	

* Service pattern prior to July 1983.

TABLE 19
IRT BROOKLYN CORRIDOR SERVICE*
BROOKLYN ROUTINGS

	PEAK	WEEKDAY 9AM-3PM	WEEKEND & EVENING	NIGHTS, SUNDAY MORNING
#2	New Lots Av Local	New Lots Av Local	New Lots Av Local	New Lots Av Local
#3	Flatbush Av Local	Flatbush Av Local	Flatbush Av Local	None
#4	Flatbush Av Express	Atlantic Av Express	Utica Av Express	Flatbush Av Local
#5	Utica Av Express	Atlantic Av Express	None	None

* Service pattern prior to July 1983.

Demand Issues

There is a preference for Lexington Avenue Line service over Seventh Avenue Line service, particularly during the peak period. 33 percent of all IRT Brooklyn Line peak period passengers (6AM to 10AM) prefer the Lexington Avenue Line, 22 percent prefer the Seventh Avenue Line and 45 percent are indifferent; for off-peak passengers (11AM - 2PM), 24 percent prefer the Lexington Avenue Line, 23 percent prefer the Seventh Avenue Line, and 53 percent are indifferent. Table 20 shows the demand patterns for the IRT Brooklyn Lines by line segment.

The Nostrand Avenue Line and the New Lots Avenue Line south of Franklin Avenue have roughly equivalent levels of ridership during both the peak (33,227 riders vs. 30,206 riders, respectively) and off-peak (4,046 riders vs. 3,771 riders) periods. During the peak period, all IRT Brooklyn Line segments have approximately equal preferences for Seventh Avenue Line service and Lexington Avenue Line service. During the off-peak period, passengers from the New Lots Avenue Line between Bergen Street and New Lots Avenue indicated a preference for Seventh Avenue Line service, while passengers from Downtown Brooklyn and the Nostrand Avenue Line (President Street to Flatbush Avenue) indicated a preference for Lexington Avenue Line service.

Based on this identified demand for service, equivalent levels of service should be provided on the Nostrand Avenue and New Lots Avenue Lines. The current service pattern addresses

TABLE 20
IRT BROOKLYN LINE DEMAND

6AM - 10AM				
DOWNTOWN BROOKLYN SEGMENT				
Demand to:			1,621	23.6%
Lexington Av	5,090	29.0%	1,190	17.3%
Seventh Av	1,985	11.3%	4,054	59.1%
All Others	<u>10,467</u>	59.7%		
Segment Total	17,542		6,865	
BERGEN ST - FRANKLIN AV SEGMENT				
Demand to:			437	29.1%
Lexington Av	3,393	35.1%	614	40.8%
Seventh Av	2,729	28.3%	453	30.1%
All Others	<u>3,535</u>	36.6%		
Segment Total	9,657		1,504	
PRESIDENT ST - FLATBUSH AV SEGMENT				
Demand to:			1,032	25.5%
Lexington Av	11,698	35.2%	833	20.6%
Seventh Av	7,834	23.6%	2,181	53.9%
All Others	<u>13,695</u>	41.2%		
Segment Total	33,227		4,046	
NOSTRAND AV - UTICA AV SEGMENT				
Demand to:			420	22.0%
Lexington Av	6,285	36.0%	509	26.7%
Seventh Av	3,712	21.3%	977	51.3%
All Others	<u>7,455</u>	42.7%		
Segment Total	17,452		1,906	
SUTTER AV - NEW LOTS AV SEGMENT				
Demand to:			399	21.4%
Lexington Av	3,703	29.0%	529	28.4%
Seventh Av	3,468	27.2%	937	50.2%
All Others	<u>5,583</u>	43.8%		
Segment Total	12,754		1,865	
ALL IRT BROOKLYN CORRIDOR SEGMENTS				
Demand to:				
Lexington Av	30,169	33.3%	3,909	24.2%
Seventh Av	19,728	21.8%	3,675	22.7%
All Others	<u>49,635</u>	44.9%	8,602	53.1%
Total All Segments	90,632		16,136	

peak period demand and an off-peak preference for Seventh Avenue Line service from New Lots Avenue. However, an off-peak preference for Lexington Avenue Line service from Flatbush Avenue is not accommodated by the current service pattern, except nights.

Alternative Analysis

The objectives of the alternatives analysis were to develop route proposals which better match service to identified demand, increase service reliability, and simplify the service patterns within the current physical limitations of the IRT Brooklyn Lines. Alternatives were developed to meet these objectives that would:

- o Reduce the number of time periods during which different service patterns are operated (e.g.: combining the midday, evening and weekend periods,) so that only three service patterns would be operated (peak periods, midday/evening/weekend, and night/Sunday morning) as on other lines in the system.
- o Reduce the number of routing variations during each time period, in order to simplify the service pattern.
- o Provide through service to the Lexington Avenue Line from the Flatbush Avenue Line at all times, reflecting identified off-peak demand.
- o Shorten the route length of the #2, as the line's length contributes to making it the least reliable service in the system (only 73 percent of the scheduled #2 trains were on time at their arrival terminal during FY1983).

The service pattern analysis can be simplified by looking at alternative service destinations (Seventh Avenue Line vs. Lexington Avenue Line/Nostrand Avenue Line vs. New Lots Avenue Line) instead of alternative routes (i.e., #2, #3, #4, and #5). The track configuration limits routing possibilities, however, due to multiple merges and train crossings. For example, if one service was to be short-turned at Atlantic Avenue it must be a Lexington Avenue line service, in order to maintain service to the local stations between Atlantic and Franklin Avenue, and the Seventh Avenue Line service must be operated through to the east. Otherwise, the track configuration at Atlantic Avenue would require the Lexington Avenue Line and Seventh Line services cross each other, to the detriment of service reliability and running time.

The following alternatives maintain the current Manhattan and Bronx service pattern. Those routes not mentioned maintain the current Brooklyn service pattern.

Alternative 1:

Operate the #3 to Atlantic Avenue and the #4 local to Flatbush Avenue middays, evening and weekends.

Discussion:

The proposal provides no changes for the current peak period and midnight service patterns. The proposed midday, evening and weekend service is as follows:

- o #2 Local to New Lots Avenue
- o #3 to Atlantic Avenue
- o #4 Local to Flatbush Avenue
- o #5 to Atlantic Avenue

Advantages:

- o It provides through service from the Nostrand Avenue Line to the Lexington Avenue Line at all times; in the midday this will benefit 25.5 percent (1,032) of the Nostrand Avenue Line riders.
- o It provides off-peak Lexington Avenue Line service to Bergen Street, Grand Army Plaza, and Eastern Parkway stations, supplementing the Seventh Avenue Line local service, providing direct service during the midday to the 29.1 percent of passengers who prefer Lexington Avenue Line.
- o It simplifies the overall IRT Brooklyn Line service pattern.

Disadvantages:

- o Terminating the #3 at Atlantic Avenue, as required by this alternative, requires the #3 to cross the #4, and to merge with the #5, a maneuver which is not operationally desirable.
- o The #3 and #5, and the #2 and #4 would share platforms at Atlantic Avenue; loss of the dedicated platforms for Lexington Avenue Line and Seventh Avenue Line services could cause passenger confusion.

Alternative 2:

Operate the #4 to Flatbush Avenue and the #5 express to Utica Avenue, midday, evenings and weekends.

Discussion:

This proposal provides no change in the peak period or night service patterns. The proposed midday, evening and weekend service pattern is as follows:

- o #2 local to New Lots Avenue
- o #3 local to Flatbush Avenue
- o #4 express to Flatbush Avenue
- o #5 express to Utica Avenue

Advantages:

- o Provides the Nostrand Avenue Line with Lexington Avenue Line and Seventh Avenue Line services at all times (except nights), reflecting identified demand at all times except nights.
- o Provides a consistent Lexington Avenue Line express service to Utica Avenue at all times (except nights).
- o Simplifies the IRT Brooklyn Line service pattern by operating the same service pattern at all times (except nights).

Disadvantages:

- o It maintains the peak period service pattern when the passenger loads do not warrant the additional service, which would increase operating costs.

Alternative 3:

Operate the #3 to Atlantic Avenue, the #4 local to Flatbush Avenue, and the #5 local to Utica Avenue

Discussion:

This proposal provides no changes in the current peak period and night service patterns. The proposed midday, evening and weekend service is as follows:

- o #2 local to New Lots Avenue
- o #3 to Atlantic Avenue
- o #4 local to Flatbush Avenue
- o #5 local to Utica Avenue

Advantages:

- o It provides a through service to the Lexington Avenue Line at all times from the Nostrand Avenue Line; in the midday this will benefit 25.5 percent (1,032) of the passengers.
- o It provides off-peak through to the Lexington Avenue Line from Bergen Street, Grand Army Plaza, and Eastern Parkway stations; in the midday this will benefit an additional 29.1 percent (437) of the passengers, without disadvantaging any existing passengers.

- o It provides off-peak Lexington Avenue Line service to Nostrand Avenue, Kingston Avenue, and Utica Avenue stations; in the midday this will benefit 22.0 percent (420) of the passengers, without disadvantaging any existing passengers.
- o It simplifies the overall IRT Brooklyn Line service pattern.

Disadvantages:

- o Terminating the #3 on the express tracks at Atlantic Avenue requires the #2, #4, and #5 to operate on the local track, providing a higher level of service to the local stations between Atlantic Avenue and Utica Avenue than is warranted by identified demand.
- o Terminating the #3 at Atlantic Avenue, as required by this alternative, requires the #3 to cross the #4, and to merge with the #5, a maneuver which is not operationally desirable.
- o Congestion may result between Atlantic Avenue and Franklin Avenue through operating three services on one track.

Alternative 4: Operate the #2 to South Ferry, the #3 local to New Lots Avenue, and the #4 local to Flatbush Avenue.

Discussion:

This proposal would change the current peak and off-peak period services to operate as follows:

	<u>PEAK PERIODS</u>	<u>OFF-PEAK</u>	<u>NIGHTS</u>
#2	Flatbush Avenue Local	South Ferry	South Ferry
#3	New Lots Avenue Local	New Lots Avenue Local	New Lots Avenue Local
#4	Flatbush Avenue Express	Flatbush Avenue Local	Flatbush Avenue Local
#5	Utica Avenue Express	Atlantic Avenue	Shuttle Service in the Bronx

Advantages:

- o It provides through-service from the Nostrand Avenue Line to the Lexington Avenue Line at all times; in the midday this will benefit 25.5 percent (1,032) of the passengers.

- o It shortens the #2 route length.
- o It provides additional off-peak service to Cortland Street, Rector Street, and South Ferry Stations.
- o It simplifies the overall IRT Brooklyn Line service pattern.

Disadvantages:

- o South Ferry does not have the terminal capacity to accommodate additional trains. 34th Street can not be used as a substitute as it is needed for bad order trains.
- o It reduces up to 50 percent the amount of off-peak Seventh Avenue Line service to all stations between Park Place and Atlantic Avenue.
- o It requires operating three services at all times between 96th Street and Chambers Street, which is not justified by night ridership levels.

Proposed Alternatives

The preceding alternatives were reviewed to determine which produced the greatest benefit with the least disbenefit to the riding public, while staying within the Study guidelines for route and service changes. Alternatives #1, 3 & 4 are operationally undesirable and the disadvantages associated with Alternatives #2 & 4 outweigh the benefits achieved by the proposed changes. As a result, no alternative was proposed for further consideration.

Culver Corridor

The Culver Corridor is defined by the alignment of the Culver Line through Brooklyn between Jay Street Station, Brooklyn Heights, and Stillwell Terminal, Coney Island. From Jay Street Station, the line runs south as a four-track subway beneath Smith Street and Ninth Street to Prospect Park, becoming elevated briefly to cross over the Gowanus Canal. At Prospect Park, the local tracks parallel Prospect Park West, then run under Prospect Avenue and Parkside Avenue to McDonald Avenue, while the express tracks follow a separate, more direct alignment to McDonald Avenue. South of Church Avenue, the McDonald Avenue to Church Avenue. All four tracks continue beneath line is a three-track elevated facility above McDonald Avenue, Shell Road, West Sixth Street and private right-of-way to Stillwell Terminal; the line narrows to two tracks at Avenue X for the remaining distance to Coney Island. The Culver Line connects with both the Eighth Avenue Line and the Sixth Avenue Line north of Jay Street, and with the Crosstown Line north of Bergen Street.

Land use in the corridor is predominantly medium-density residential, with light industry located adjacent to the elevated along McDonald Avenue. Recreational facilities and high-density residential areas are located at southern end of the corridor around Coney Island, and institutional, commercial and retail land uses predominate the northern end of the corridor around Jay Street in the Brooklyn CBD. Most stations on the line have small, ancillary retail strips serving local neighborhoods and three stations (Seventh Avenue, 15th Street and Fort Hamilton Parkway) serve Prospect Park.

Two routes currently provide service to the Culver Lines: the "F" and "GG". The current operation of these routes is as follows:

"F" (Sixth Avenue Local) operates between 179th Street/Hillside Avenue, Queens, and Coney Island, Brooklyn, at all times except peak periods. During peak periods, the "F" operates between 179th Street/Hillside Avenue and Kings Highway, Brooklyn, with alternating "F" trains extended to Coney Island; the peak "F" trains extended to Coney Island operate express in the peak direction of traffic (northbound-AM/southbound-PM) between 18th Avenue and Kings Highway Stations.

"GG" (Crosstown Line Local) operates between 71st-Continental Avenues (Forest Hills) or Queens Plaza, Queens, and Smith-Ninth Streets, Brooklyn, at all times.

There are four major transfer stations for the Culver Line riders. At Jay Street, passengers can transfer to the "A" and "CC" to the Eighth Avenue Line, Manhattan, to the Fulton Street Line to Brooklyn and Queens, and the JFK Express. At Fourth



Culver Corridor



FIGURE
35



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Avenue, passengers can transfer to the Broadway Line service to Manhattan, and to the Fourth Avenue to Brooklyn. At West Eighth Street, passengers can transfer to the Brighton Line services and at Coney Island, passengers can transfer to the West End and Sea Beach Lines. Passengers can also transfer between the "F" and "GG" at the three shared stations.

Demand Issues

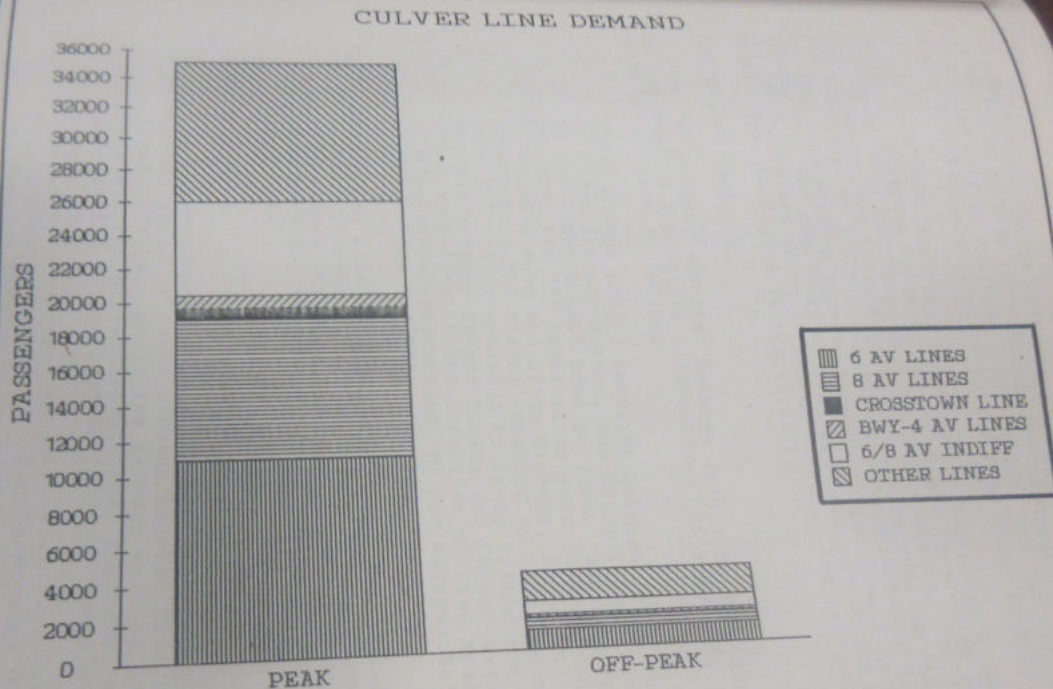
The Culver Line track configuration provides three routing options for service: to the Sixth Avenue Line, as at present, to the Eighth Avenue Line, or to the Crosstown Line. Based on identified demand for Culver Line passengers (shown in Table 21), the Sixth Avenue Line is the routing of choice for the Culver Line---it provides the greatest number of riders with direct service to their destinations (31 percent of peak riders, 25 percent of the off-peak riders). Diverting Culver Line service to the Eighth Avenue Line (the only viable alternative, preferred by 23 percent of the peak riders) would increase the number of Culver Line riders that had to transfer to reach their destinations. Further, the diversion to Eighth Avenue could result in congestion at Jay Street as the "F" trains tried to merge with the "A", "CC" and JFK Express.

TABLE 21
PRINCIPAL DESTINATIONS OF CULVER LINE RIDERS

	PEAK	OFF-PEAK
Sixth Avenue Line:	31%	25%
Eighth Avenue Line:	23%	15%
Crosstown Line:	2%	2%
Broadway & Fourth Avenue Lines:	2%	3%
Sixth/Eighth Avenue Indifferent:	16%	17%
Other Lines:	26%	38%
Total Passengers (6AM to 10AM):	35,167	
(11AM to 2PM):		4,224

The Culver Line track configuration permits expansion of the current express service. Two express tracks between Bergen Street and Church Avenue are currently unused, while a single express track between Church Avenue and Kings Highway is currently used only between 18th Avenue and Kings Highway.

In August 1968, the Authority operated peak period "F" express service between Bergen Street and Church Avenue. The "GG" operated south to Church Avenue to clear the express tracks at Fourth Avenue for "F" express operation and to provide supplemental service to local stations bypassed by the "F" express. In addition, alternating peak "F" trains operated



express between Church Avenue and Kings Highway in the peak direction of traffic (northbound-AM/southbound-PM); these trains operated to and from Coney Island, and the remaining "F" trains operated local service to and from Kings Highway.

In July 1969, the local operation of the Kings Highway "F" trains was extended north to Bergen Street to provide peak service to local stations north of Church Avenue. In January 1973, however, the Kings Highway "F" trains running against the peak direction of traffic (southbound-AM/northbound-PM) returned to operating express between Bergen Street and Church Avenue; the "GG" continued to provide peak period service to all local stations north of Church Avenue. The current service pattern was instituted in August 1976.

Alternative Analysis

The "F" express operated between July 1969 and January 1973 was reviewed as a possible alternative. As proposed, service would be operated as follows:

"F" (Sixth Avenue Local) operates between 169th Street/Hillside Avenue, Queens, and Coney Island, Brooklyn, at all times except peak periods. During peak periods, the "F" operates between 169th Street/Hillside Avenue and Kings Highway, Brooklyn, with alternating "F" trains extended to Coney Island; all peak "F" trains extended to Coney Island operate express between Bergen Street and Church Avenue and those operating in the direction of peak traffic (northbound-AM/southbound-PM) run express between Church Avenue and Kings Highway.

"GG" (Crosstown Line Local) operates between 71st-Continental Avenues (Forest Hills) or Queens Plaza, Queens, and Smith-Ninth Streets, Brooklyn, at all times. During peak periods, the "GG" is extended to Church Avenue, Brooklyn.

Advantages:

- o The express running time between Jay Street and Coney Island would be seven minutes shorter than the current local service. While the average waiting time would increase for passengers at local stations, a net-benefit is realized in terms of "people-minutes" saved, that is:

People-Minutes Saved	-----	People-Minutes Of
By Express Service	—	Added Waiting Time 0

This concept is graphically demonstrated in Figure 37.

- o The express service was advocated by the Brooklyn Borough President's office and the Community Boards at the southern end of the corridor.



**Passenger
Demand**



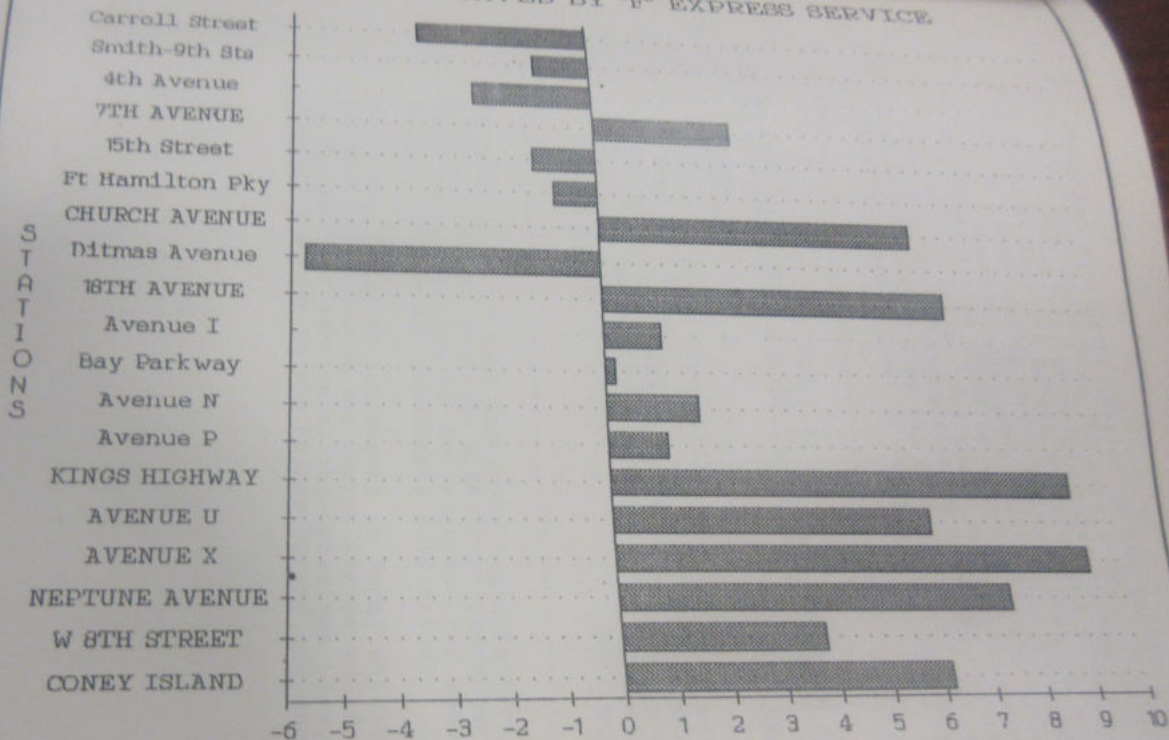
FIGURE

37



New York City
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PEOPLE-MINUTES SAVED BY "F" EXPRESS SERVICE



Express stations are CAPITALIZED

NET PEOPLE-MINUTES SAVED (in thousands)

- Establishing express service on the Culver Line could divert passengers from the more crowded Brighton Line. An analysis of origin zones in Brooklyn indicates that the market area for the Brighton and Culver Lines overlap where the two lines parallel each other, suggesting that many riders that currently use the Brighton Line could be diverted to the Culver Line, if the Culver Line could provide a superior service. The "F" express would have the shortest scheduled running time (by 30 seconds) of all the services operating out of Coney Island (see Table 22).

TABLE 22
RUNNING TIME FROM CONEY ISLAND TO 34TH STREET/SIXTH AVENUE

Route	Service	Running Time
"F"	Culver Express (proposed)	43.0 minutes
"D"- "M"	Brighton Express	43.5 minutes
"N"	Sea Beach Local/4th Av Express	45.0 minutes
"B"	West End Local/4th Av Express	47.0 minutes
"F"	Culver Express (present)	48.0 minutes
"F"	Culver Local	50.0 minutes

An examination of past turnstile registrations, however, did not indicate a shift of passenger traffic from the Culver Line to the Brighton Line when the "F" express service was previously eliminated.

- Less than a hundred passengers at local stations between Fourth Avenue and Church Avenue would benefit by through "GG" service to the Crosstown Line, and an improved transfer to the Fulton Street and Rockaways.

Disadvantages:

- o The potential for extended gaps in service would increase at local stations. The effects of a delayed train are less severe with an all-local operation because of the 4-5 minute headway between trains. However, a delayed local train with the "F" express operation could create a 16-20 minute gap in service. (This assumes worst case scenario: standard trains to protect local service, closing the gap in service.)
- o "F" train headways would be doubled at all local stops between Carroll Street and Ditmas Avenue. Although the "GG" would supplement service at these stations, there is little demand for Crosstown Line service from these stations (see Table 21). Therefore, half of the passengers at these stations would either take the "GG" and transfer for the "A" or "F" or pass up the "GG" and wait for a local "F".
- o The extension of peak "GG" service would increase the operating costs by about \$300,000* annually and increase B-Division peak car requirements by 14 cars (two additional peak trainsets).

Proposed Alternatives

The reinstitution of "F" express service between Church Avenue and Bergen Street provides an overall benefit for Culver Line riders in terms of net "people-minutes" saved. However, the additional operating cost would not result in an increase in the Culver Line capacity, only a faster trip for some Culver Line patrons. Further, the new service increases the peak car requirement for "GG" service. Therefore, "F" express service is not proposed for further consideration.

* Operating costs as of March 1983.

Southern Division Corridors

The Southern Division Corridors encompasses five separate corridors: Fourth Avenue Corridor, Sea Beach Corridor, West End Corridor, Brighton Corridor and Culver Corridor. Each corridor is defined by the alignment of its namesake transit line. Taken as a whole, these lines provide all rapid transit service to Southern Brooklyn. The Culver Line is operationally discrete from the other Southern Division Lines (except at Coney Island) and has been treated separately in the preceding section.

The last major revision to Southern Division service occurred in 1967 with the opening of the Chrystie Street Connection. Prior to the Chrystie Street Connection, all Southern Division trains operated to the Broadway Line or Nassau Street Line in Manhattan (excluding Culver Line trains, which were rerouted to the Sixth Avenue Line in 1954). The connection permitted Southern Division trains to be routed to Sixth Avenue Line in Manhattan, as well as the Broadway and Nassau Street Lines.

This section will describe the Fourth Avenue, West End, and Sea Beach Corridors collectively, as the services in these corridors share the Fourth Avenue Line track for several miles south of DeKalb Avenue Station. The description of the Brighton Corridor, which diverges from the Fourth Avenue Corridor at DeKalb Avenue, will follow.

Fourth Avenue-Sea Beach-West End Corridors

The Fourth Avenue Corridor is defined by the alignment of the Fourth Avenue Line through Brooklyn. The corridor begins at DeKalb Avenue Station, where three lines merge: a two-track line from the Montague Street Tunnel, which connects to the Broadway and Nassau Street Lines in Manhattan, a two-track line over the Manhattan Bridge to the Broadway Line and another two-track line over the Manhattan Bridge to the Sixth Avenue Line, via the Chrystie Street Connection. The Fourth Avenue Line runs south of DeKalb Avenue as a four-track subway beneath Flatbush Avenue, Fulton Street, Ashland Place and Fourth Avenue. The West End Line diverges from the Fourth Avenue Line at 36th Street and the Sea Beach Line diverges south of 59th Street. The Fourth Avenue Line continues south of 59th Street as a two-track subway to its terminus at 95th Street/Fourth Avenue.

The Sea Beach Corridor is defined by the alignment of the Sea Beach Line, starting from where it departs the Fourth Avenue Line at 59th Street. The line diverges as a two-track line that broadens to a four-track line operating in an open cut parallel to the ConRail Bay Ridge Line to New Utrecht Avenue, between 63rd and 64th Streets to 20th Avenue, then



Southern
Division
Corridors



FIGURE
38



New York City
Transit
Authority



between West Seventh and Eighth Streets to 86th Street. The line continues south of 86th Street as a two-track facility at grade to a terminus at Coney Island.

The West End Corridor is defined by the alignment of the West End Line, starting from where it departs the Fourth Avenue Line at 36th Street. The two-track line briefly runs parallel to the South Brooklyn Railway, then ascends to become a three-track elevated facility above New Utrecht Avenue, 86th Street and Stillwell Avenue. South of Bay 50th Street, the line descends to grade and narrows to two tracks, running via private right-of-way to Coney Island Terminal.

Land use in these corridors is predominately medium density residential. In the Fourth Avenue and Sea Beach Corridors, there are major industrial areas which include Industry City, Bush Terminal and a zone along the Sea Beach Line between Fifth and 17th Avenues.

Commercial areas in the Fourth Avenue and Sea Beach Corridors are located along 86th Street in both Bay Ridge and Bensonhurst and at 18th Avenue, Bay Parkway, and Kings Highway Stations. There are three shopping areas along Fifth Avenue, a block east of the Fourth Avenue Line, located between 7th - 16th Streets, 45th - 60th Streets and 70th - 86th Streets.

The Coney Island amusement activities and beach, located at the southern terminal of Sea Beach, West End, Culver and Brighton Lines, are major summertime traffic generators. Other generators within the corridors include Greenwood Cemetery, Lutheran Hospital (near the 53rd Street/Fourth Avenue station), and the Marlboro Houses---located between the West End line (Bay 50th Street station) and the Sea Beach line (86th Street station).

Within the West End Corridor is a combination of industrialized and residential uses between 36th Street and Ninth Avenue. Major shopping areas are on 13th Avenue in Borough Park, near 50th Street and 55th Street stations, and at 86th Street in Bensonhurst, which is served by all stations between 18th Avenue and 25th Avenue. New Utrecht High School, near the 79th Street station, is another generator in the corridor.

Current Service

Three routes currently provide service to the Fourth Avenue, Sea Beach, and West End Lines: the "B", "N", and "RR". The current operation of these routes is as follows:

"B" (Sixth Avenue Local) operates between 57th Street/Sixth Avenue, Manhattan, and Coney Island, Brooklyn, at all times except nights; the southbound "B" operates express on Sixth Avenue, Manhattan, during PM peak periods. The "B" (Sixth Avenue Express) also

operates between 168th Street/Broadway, Manhattan, and Coney Island, Brooklyn, during peak periods. In Brooklyn, the "B" operates express between Pacific Street and 36th Street/Fourth Avenue (skipping DeKalb Avenue during peak periods). At nights, two "B" shuttles operate: between 57th Street-Sixth Avenue and 50th Street-Sixth Avenue, Manhattan, and between 36th Street-Fourth Avenue and Coney Island, Brooklyn.

"N" (Broadway Express/Local during peak periods: Downtown-AM/Uptown-PM) operates between 57th Street/Seventh Avenue, Manhattan, and Coney Island, Brooklyn, at all times except nights. In Brooklyn, the "N" operates express between Pacific Street and 59th Street/Fourth Avenue (skipping DeKalb Avenue during peak periods). At night the "N" Shuttle operates between 36th Street-Fourth Avenue and Coney Island, Brooklyn.

"RR" (Broadway Local) operates between Ditmars Boulevard, Queens and 95th Street/Fourth Avenue at all times. During peak periods, an alternative "RR" service, designated as the "RJ" (Nassau Street Local), operates between Chambers and 95th Street/Fourth Avenue in the direction of peak traffic.

Table 23 shows the Fourth Avenue Line service operated by the lines in the corridors.

TABLE 23
FOURTH AVENUE LINE SERVICE PATTERNS

	MANHATTAN SERVICE	-----BROOKLYN ROUTINGS-----		
		PEAK SERVICE	BASE SERVICE	NIGHT SERVICE
"B"	6Av Local /Express	4Av Express Skip DeKalb	4Av Express Stop DeKalb	Shuttle to 36 St/4 Av
"N"	Broadway Express	4Av Express Skip DeKalb	4Av Express Stop DeKalb	Shuttle to 36 St/4 Av
"RR"	Broadway Local	4Av Local Local	4Av Local Local	4Av Local Local
"RJ"	Nassau St Local	4Av Local Local	None	None

The major transfer stations in this corridor are at DeKalb Avenue and at Pacific Street. DeKalb Avenue is the primary interchange for the corridors, where all Southern Division passengers can transfer between Sixth Avenue Line, Broadway Line and Nassau Street Line services. Pacific Street provides access to the IRT Brooklyn Lines to the Lexington Avenue and Seventh Avenue Lines in Manhattan and to Eastern Parkway, Flatbush Avenue and New Lots Avenue in Brooklyn. Passengers can also transfer to the Culver Line in Brooklyn (then, ultimately, to the IND Fulton Street and Crosstown Lines through further transfers) at Ninth Street/Fourth Avenue, a local station on the Fourth Avenue Line. Finally, transfers between the West End and the Sea Beach Lines can also be made at 62nd Street/New Utrecht Avenue stations.

Demand Issues

The peak period demand for service from the three corridors is shown Table 24. Fourth Avenue Line riders show a higher preference for Lower Manhattan and Downtown Brooklyn destinations (11835 passengers - 41.3%) than West End Line riders (6761 passengers - 32.2%) or Sea Beach Line riders (6453 passengers - 34.2%). The proportion of passengers destined for Midtown is higher on the Sea Beach Line (7173 passengers - 37.9%) and West End Line (8278 passengers - 39.5%), than on the Fourth Avenue Line (8540 passengers - 29.8%). However, the absolute number of passengers from the Fourth Avenue Line is still the largest.

TABLE 24
PEAK PERIOD DEMAND FOR SERVICE
(6AM to 10AM)

DESTINATIONS	FOURTH AVENUE (95St-Pacific)		SEA BEACH (Coney Is-59St)		WEST END (Coney Is-36st)	
DWNTWN BKLYN	9.4%	2,696	8.3%	1,566	8.0%	1,669
BWY-LOWER MHTN	22.8%	6,528	16.7%	3,141	17.1%	3,575
NASSAU ST	9.1%	2,611	9.2%	1,746	7.2%	1,517
BWY-MIDTOWN	20.6%	5,908	33.2%	6,275	7.7%	1,608
6AV-MIDTOWN	9.2%	2,632	4.7%	898	31.8%	6,670
UPTOWN IND	1.1%	325	0.4%	74	1.8%	370
OTHER	26.6%	7,947	27.3%	5,135	26.5%	5,558
TOTAL		28,647		18,825		20,967

The off-peak service demand is shown in Table 25. These figures suggest that off-peak demand is adequately addressed by the current service pattern. In addition, movements to and from the West End and Sea Beach Lines are facilitated by the DeKalb Avenue transfer (all lines stop at DeKalb Avenue off peak).



Passenger Demand

FIGURE
39



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FOURTH AVENUE-SEA BEACH-WEST END DEMAND
PEAK (6AM to 10AM)

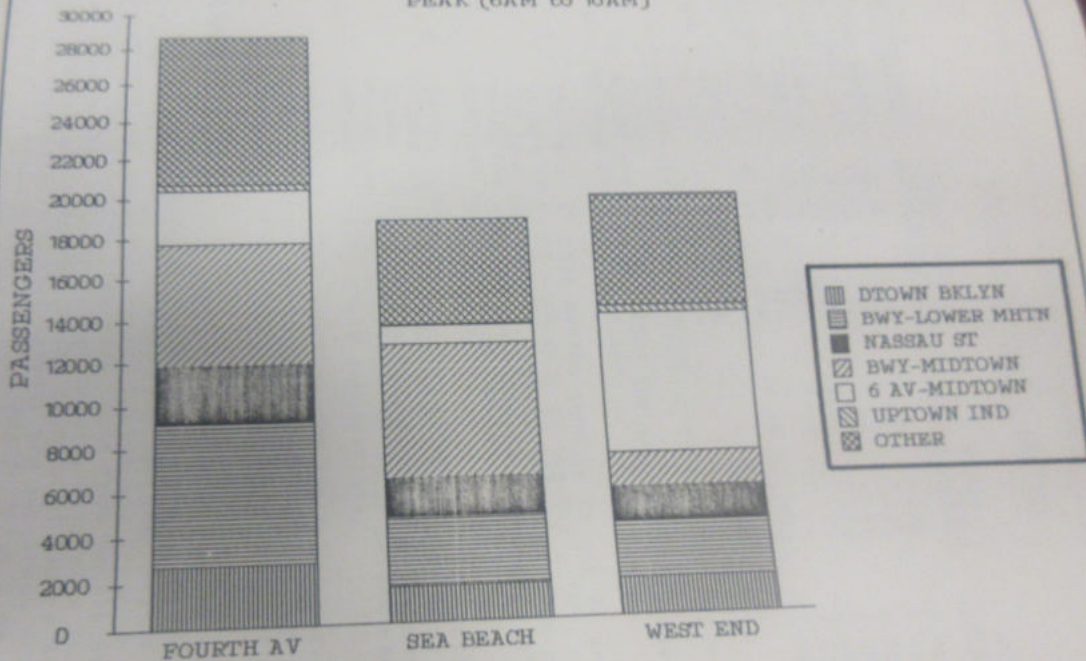


TABLE 25
OFF-PEAK DEMAND FOR SERVICE
(11AM to 2PM)

DESTINATIONS	FOURTH AVENUE (95St-Pacific)		SEA BEACH (Coney Is-59St)		WEST END (Coney Is-36st)	
	%	Passengers	%	Passengers	%	Passengers
DWNTWN BKLYN	15.7%	598	23.5%	470	12.9%	363
BWY-LOWER MHTN	11.7%	448	6.1%	122	5.1%	143
NASSAU ST	0.9%	34	2.7%	54	0.9%	25
BWY-MIDTOWN	23.1%	881	28.9%	578	7.2%	202
6AV-MIDTOWN	9.3%	355	4.7%	94	30.5%	858
UPTOWN IND	1.9%	325	0	0	1.5%	42
OTHER	37.4%	1,426	34.1%	683	41.9%	1,178
TOTAL		3,816		2,001		2,811

The demand issues identified for the Fourth Avenue, Sea Beach, and West End Corridors are:

- o The level of peak period service is not in proportion to the level of ridership on the "RR", "B", and "N". The peak period "RR" averages 60 passengers per car while the peak "B" averages 112 passengers per car but operates less frequent service.
- o During peak periods, 34.2 percent of all West End Line riders and 32.3 percent of all Sea Beach Line riders prefer service to Downtown Brooklyn and Lower Manhattan, but must transfer at or before Pacific Street to reach these destinations.
- o The peak period "RR" and "RJ" are duplicative, with both services operating between 95th Street and Lower Manhattan stops within two blocks of each other.

Brighton Corridor

The Brighton Corridor is defined by the alignment of the Brighton Line through Brooklyn. The corridor begins at DeKalb Avenue Station, where the Fourth Avenue and Brighton Lines diverge. The Brighton line runs south from DeKalb Avenue as a two-track subway beneath Fulton Street, St. Felix Street and Flatbush Avenue to Prospect Park Station at Empire Boulevard. The Brighton Line is joined here by the two-track Franklin Shuttle Line from Fulton Street. The Brighton Line continues south as a four-track rapid transit facility operating via earthworks above, below or at grade paralleling Ocean Avenue as far as Parkside Avenue, thence via a diagonal path to a point near Beverly Road and East 16th Street to parallel East 16th Street as far as Sheepshead Bay Road. From there, the line runs via a diagonal path to Coney Island Avenue and Brighton Beach Avenue, whereupon it ascends to an elevated structure above Brighton



Passenger Demand

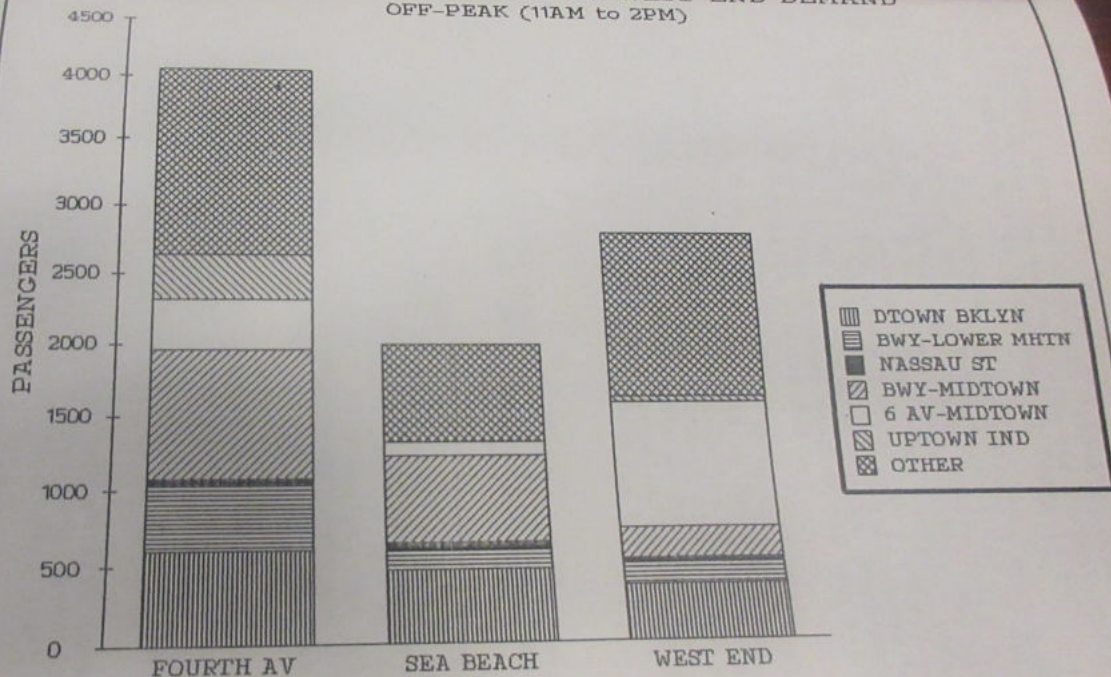
FIGURE

40



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FOURTH AVENUE-SEA BEACH-WEST END DEMAND
OFF-PEAK (11AM to 2PM)



Beach Avenue, and runs above that avenue to Ocean Parkway, where the line narrows to two tracks and follows above a private right-of-way to a terminus at Coney Island.

Land use in the corridor is predominately medium-density residential, although there are localized areas of low-density residential use throughout its length. While there is ancillary commercial activity at most stations, the major commercial areas are located along Kings Highway, extending both directions from the subway station, at Flatbush and Church Avenues, located three blocks from the Church Avenue Station and at Avenues J, M, and U. The Kings Plaza shopping center is accessible from the Kings Highway station via the B-2 bus and from the Avenue U station via the B-3 bus.

Like Fourth Avenue Line trains, Brighton Line trains have several alternative routes available at DeKalb Avenue. They can operate via the Montague Street Tunnel to either the Broadway or Nassau Street Lines. Trains can operate via the Manhattan Bridge to the Broadway Line or to the Sixth Avenue Line. Along Sixth Avenue, trains from the Manhattan Bridge can use either the local track or the express track.

Current Service

Three routes currently provide service to the Brighton Line: the "D", "M", and "QB". The current operation of these routes is as follows:

"D" (Sixth Avenue Express) operates between 205th Street/Bainbridge Avenue, the Bronx, and Brighton Beach, Brooklyn, at all times. The "D" is extended to Coney Island, Brooklyn, weekdays between 8PM and 6:30AM, Saturdays and Sundays. In Brooklyn, the "D" operates express service between Prospect Park and Brighton Beach during the hours that the "M" operates to Coney Island.

"M" (Nassau Street Local) operates between Metropolitan Avenue, Queens, and Coney Island, Brooklyn, weekdays between 6AM and 9PM. At all other times, the "M" Shuttle operates between Metropolitan Avenue and Myrtle Avenue, Brooklyn.

"QB" (Broadway Express) operates between 57th Street/Seventh Avenue, Manhattan, and Coney Island, Brooklyn, during peak periods in the direction of peak traffic.

In addition, the Franklin Avenue Shuttle connects with the Brighton Line at Prospect Park Station. The shuttle operates between Prospect Park on the Brighton Line and Franklin Avenue on the Fulton Street Line, with free transfers provided at both terminals. The Franklin Avenue Line is aligned to permit the shuttle to continue south to Coney Island (the historic service pattern for the Franklin Avenue Line operated when the line's

northern terminus connected to the former BMT Fulton Street El to the Brooklyn Bridge).

DeKalb Avenue, at the north end of the corridor, is a major transfer point for Brighton Line passengers transferring to the Fourth Avenue Line serving western and southwestern Brooklyn and for service to Manhattan and Downtown Brooklyn Lines, and the Lexington Avenue Line and Seventh Avenue Line in Manhattan. Other transfer movements occur at Coney Island to the Culver, Sea Beach and West End Lines and, to a lesser degree, at West Eighth Street between the Brighton and Culver Lines.

Demand Issues

Service demand from the Brighton Line is shown in Table 26. These figures suggest that peak period demand is adequately addressed by the current service pattern: 22.1 percent of all Brighton Line riders indicated a preference for the "M", 10.1 percent of all riders indicated a preference for the "QB", and 27.1 percent of all riders indicated a preference for the "D". The remaining riders were indifferent between two or more services, transfer before leaving Brooklyn, or have destinations along the Brighton Line. During the off-peak, 14.2 percent prefer "M" service, 5.7 percent prefer Broadway Line service to Midtown (the "N" or "RR" at DeKalb Avenue), 5.0 percent prefer Broadway Line service to Downtown ("RR"), and 27.0 percent prefer "D" service.

TABLE 26
BRIGHTON LINE DEMAND

	PEAK		OFF-PEAK	
	(6AM - 10AM)		(11AM - 2PM)	
ATLANTIC AV	1.1%	700	2.3%	205
DEKALB AV	6.0%	1,179	2.4%	217
DTOWN BKLYN	1.9%	373	6.9%	614
BWY-LOWER MHTN	9.2%	5,683	5.0%	445
NASSAU ST	13.7%	8,451	5.6%	500
NASSAU Connections	2.4%	1,472	1.7%	156
34 ST/6AV	7.0%	4,338	5.6%	505
6AV-MIDTOWN	17.3%	10,683	19.8%	1,771
6AV Connections	9.8%	6,040	7.2%	647
BWY-MIDTOWN	9.9%	6,102	5.7%	506
BWY Connections	0.1%	85	0%	0
OTHER	21.6%	13,292	37.8%	3,378
TOTAL		61,755		8,944



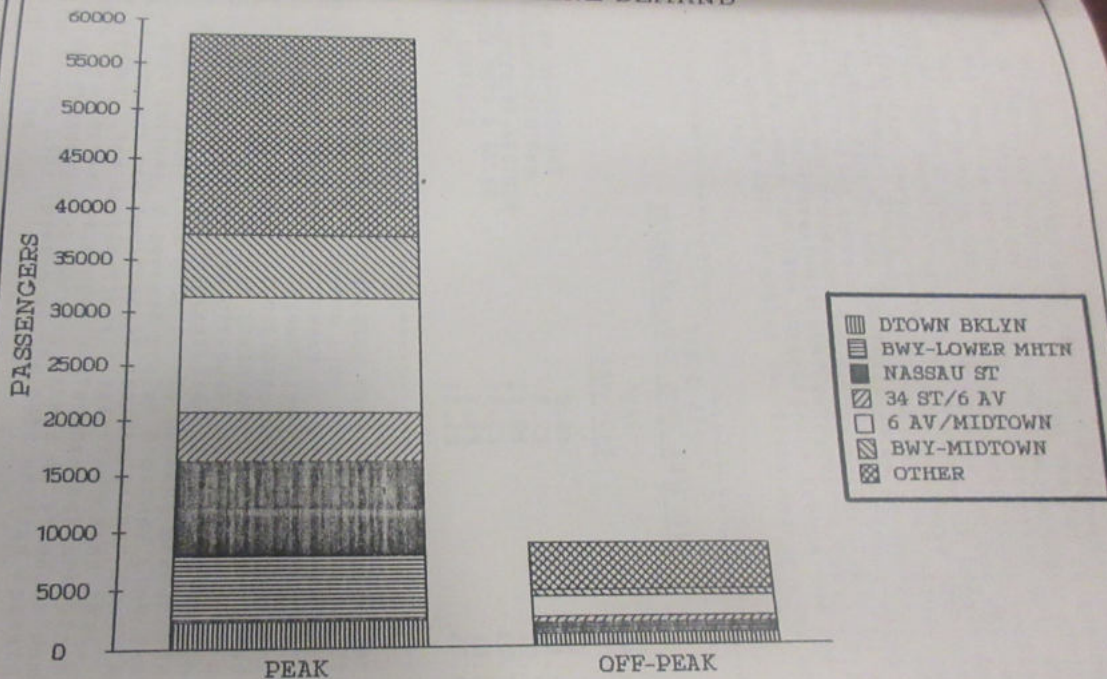
Passenger Demand

FIGURE
41



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BRIGHTON LINE DEMAND



Off-peak Brighton Line service is currently provided by the "D" to the Sixth Avenue Line and the "M" to the Nassau Street Line (the latter service only on weekdays until 8PM); the "QB" service to the Broadway Line operates only during peak periods. Ridership data collected by the Study indicated that most off-peak Brighton Line riders with Midtown destinations used the "D" service rather than transfer at DeKalb Avenue to Broadway Line service, even if their ultimate destination was nearer a Midtown Broadway Line station. The actual preference for Midtown service was investigated by an analysis of the final destination zones of Brighton Line riders using the Sixth Avenue Line and Broadway Line services (see Table 27 and Figure 42). The "Indifferent-Midtown" category in Table 27 denotes passengers bound for 34th Street/Sixth Avenue and for zones served equally well by either the Sixth Avenue Line or the Broadway Line.

TABLE 27
BRIGHTON LINE ZONE ANALYSIS

	PEAK 6AM-10AM	OFF-PEAK 11AM-2PM
SIXTH AV-MIDTOWN	9.3%	8.7%
BROADWAY-MIDTOWN	5.7%	3.5%
INDIFFERENT-MIDTOWN	31.8%	30.3%
LOWER MHTN & BKLYN	32.2%	20.1%
IRT SERVICES	8.9%	16.8%
OTHER	12.1%	20.6%

The zone analysis indicated that, during peak periods, 46.8 percent of all Brighton Line riders were traveling to Midtown destinations. Of these Brighton Line riders, 20 percent prefer Sixth Avenue Line destinations, 12 percent prefer Broadway Line destinations, and 68 percent are indifferent between either Sixth Avenue Line or Broadway Line destinations. During the off-peak, 42.3 percent of all Brighton Line riders were traveling to Midtown destinations. Of these Brighton Line riders, 20 percent prefer Sixth Avenue Line destinations, 8 percent prefer Broadway Line destinations, and 72 percent are indifferent between either Sixth Avenue Line or Broadway Line destinations. This indicates that, where there is an actual passenger preference between Sixth Avenue Line and Broadway Line service, there is stronger demand for Sixth Avenue Line service as the base service operated on the Brighton Line.

There were two demand issues identified for the Brighton Line service:

- o The combined frequency of service operating on the Brighton Line during peak and off-peak periods is significantly higher than that provided to other lines, when compared to its ridership.



Passenger Demand

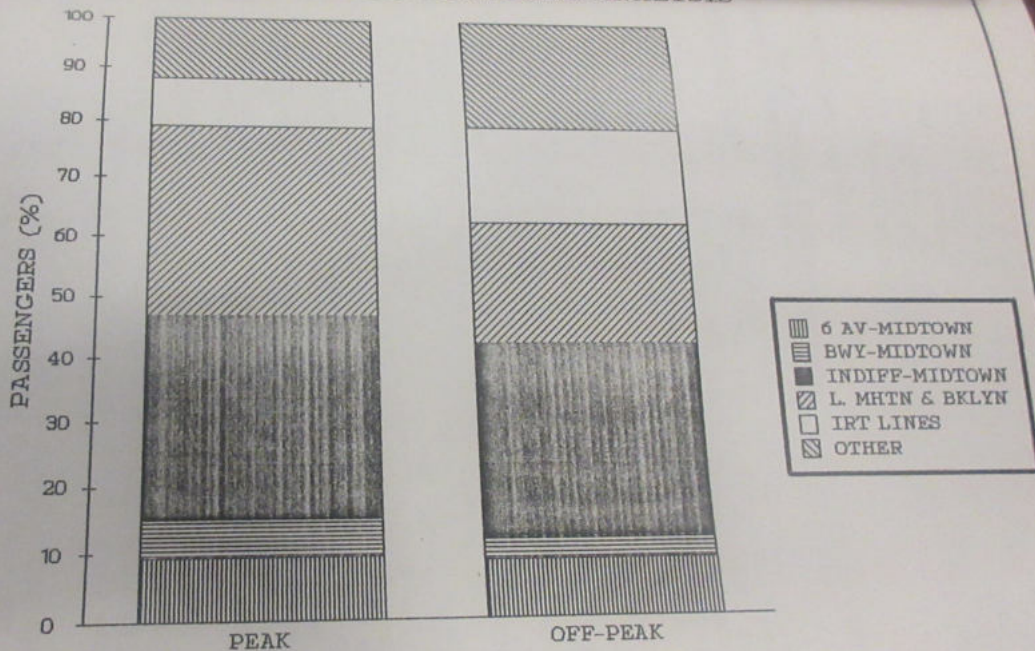
FIGURE

42



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BRIGHTON LINE ZONE ANALYSIS



- o The use of Brighton Beach as a terminal for the "D" express service is inconvenient as the express service ("D") short-turns and the local services ("M" & "QB") operate through to Stillwell Avenue. Further, the arrangement is confusing to the passengers as the northbound "D" trains can arrive at either the northbound or southbound platforms.

Alternatives Analysis

The following alternatives were considered to address the demand issues identified for the Southern Division:

Alternative 1:

Replace the "QB" and "RJ" service with more frequent "M" service and a new peak period service, designated as the "NX", between 57th Street/Seventh Avenue, Manhattan, and Brighton Beach, Brooklyn, operating express on the Sea Beach Line.

Discussion:

As proposed, the morning "NX" would operate from Brighton Beach to Stillwell Avenue, then run to 59th Street/Fourth Avenue via the Sea Beach Line express tracks. The "NX" would operate express on the Fourth Avenue Line (skipping DeKalb Avenue) and to the Broadway Line in Manhattan, terminating at 57th Street/Seventh Avenue. The "NX" would operate as a peak period service only in the peak direction of traffic. Under this proposal, the "QB" would be eliminated, as the "NX" would provide a more attractive service to the same Manhattan destinations and "M" service would be increased to maintain sufficient local Brighton Line service in the peak direction of traffic. The "RJ" would be eliminated as the "NX" would reduce the peak period capacity of the Montague Street Tunnel. However, the "NX" provides Fourth Avenue Line service to Broadway Line stops near "RJ" stops and additional "M" service would be operated to Nassau Street.

Advantages:

- o The "NX" would decrease the running time between Stillwell Avenue and Manhattan and would attract approximately 5,700 passengers.
- o The "NX" reduces the need to operate two special services ("QB" and "RJ") by combining them into one special service, simplifying the overall service pattern.
- o Peak "M" service would be increased, providing more direct Brighton Line service to Downtown Brooklyn and Lower Manhattan, better serving 9,923 riders.



Passenger Demand

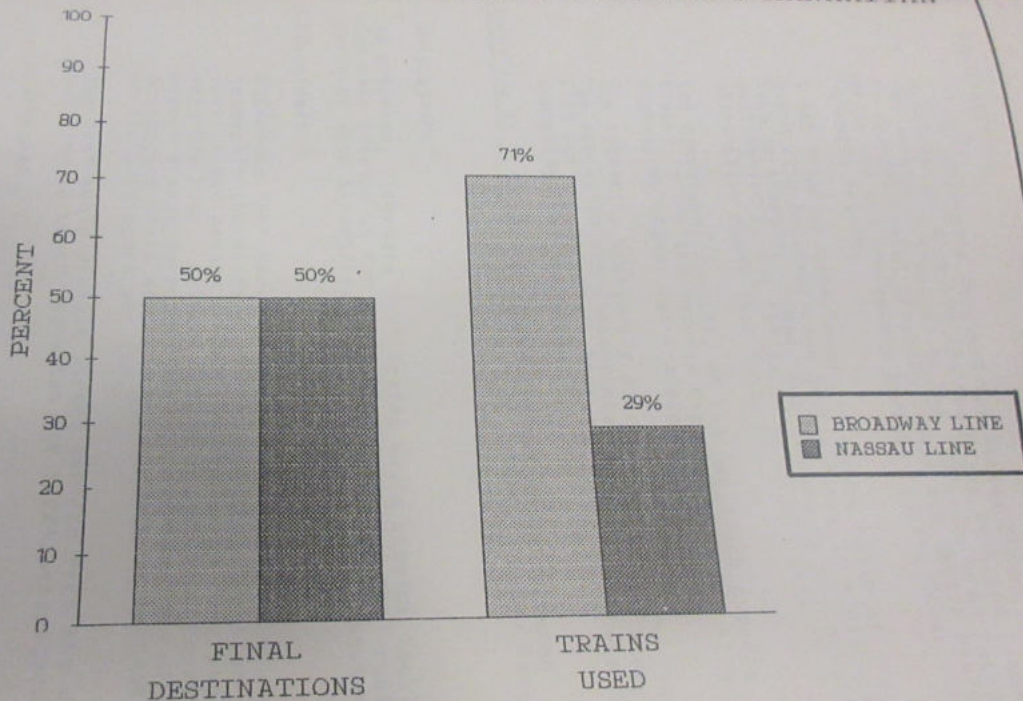
FIGURE

43



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PEAK TRAVEL FROM FOURTH AVENUE TO LOWER MANHATTAN



Disadvantages:

- o 3,250 passengers destined for Nassau Street Line destinations from the Sea Beach and West End Lines, who currently transfer to the "RJ", would be required to transfer twice (Pacific Street and DeKalb Avenue) or to use the passageway between Pacific Street and Atlantic Avenue.
- o 1,100 Brighton Line local passengers north of Brighton Beach with Broadway Line destinations in Midtown would have to transfer. These are passengers not equally well served by the "D" based on an analysis of destination zones (see Table 27).
- o The functional capacity of the Sea Beach express tracks is limited between Eighth Avenue and King Highway by signal constraints.
- o The Authority previously operated the "NX" in 1967. The operation was discontinued due to a low ridership (The current proposal, however, would eliminate the competing "QB" service).

Alternative 2:

Operate alternate "RR" trains between Ditmars Boulevard, Queens, and Bay Parkway, Brooklyn, on the West End Line.

Discussion:

As proposed, alternate "RR" trains would provide local West End Line service as far as Bay Parkway. The "RR" route north of 36th Street/Fourth Avenue would remain unchanged.

Advantages:

- o Alternate "RR" service to the West End Line would reconcile the differences between the levels of service and demand on the Fourth Avenue Line and the West End Line. Between 7:20AM and 8:45AM, Fourth Avenue trains currently have an average load of 60 passengers while West End trains have an average load of 112 passengers per car.
- o The "RR" would provide direct service from the West End Line to Lower Manhattan for 5,224 passengers.

Disadvantages:

- o Three different service patterns for the "RR" would result (including the "RJ"), creating passenger confusion.

- o The potential for extended gaps in service would be increased at Fourth Avenue Line stations south of 36th Street.

Alternative 3:

Replace the "RJ" with a new peak period service, designated as the "T", between Chambers Street (Nassau Street Line) and Bay Parkway on the West End Line.

Discussion:

As proposed, the "T" would provide local West End Line service from Bay Parkway. The "T" would follow the same route north of 36th Street/Fourth Avenue as the "RJ" to Chambers Street on the Nassau Street Line. Like the "RJ", the "T" would operate during peak periods only in the peak direction of traffic.

Advantages:

- o The "T" would provide a direct trip from the West End Line to Downtown Brooklyn and Lower Manhattan for 3,186 passengers.
- o The "T" provides a better proportion of service between the West End and Fourth Avenue Lines by providing more West End service. The average load per car on the Fourth Avenue Line would increase from 60 to 73 passengers, while the average load per car on the West End Line would decrease from 112 to 94 passengers. (n.b.: these are 60-foot cars with a "comfort" loading capacity of 115 passengers.)
- o The "T" maintains the existing levels of peak period service between 36th Street and Pacific Street.

Disadvantages:

- o The "T" would decrease peak period Fourth Avenue Line service between 45th Street and 95th Street and eliminates the direct service to Nassau Street for 2,611 passengers from these station. The Broadway Line "RR" stops, however, are within 2 blocks of the Nassau Street Line "RJ" stops in Lower Manhattan, so these passengers may not have to transfer for Nassau Street service.
- o The "T" does not directly satisfy the West End Line preference for Broadway Line destinations over Nassau Street Line destinations, but the Broadway Line "RR" stops are within 2 blocks of the Nassau Street Line "RJ" stops in Lower Manhattan, so these passengers may not have to transfer for Nassau Street service. Currently, 3,575 West End Line peak riders transfer for the Broadway Line to Lower Manhattan, while 1,517 riders transfer to Nassau Street Line service.

Alternative "T" routes from the West End Line to Chambers Street were studied at the request of local Community Boards, including:

- "T" express on West End Line:
 - Not recommended as 78 percent of all West End Line passengers board at local stops.
- "T" from Stillwell Avenue:
 - Not recommended as Stillwell Terminal does not have sufficient track capacity to originate all "B" and "T" trains. If the "T" operates from Bay Parkway, all "B" trains can operate from Stillwell Terminal.

Alternative 4:

Replace peak period "M" service to the Brighton Line with a new local service, designated as the "QT", between 57th Street/Seventh Avenue, Manhattan, and Coney Island, Brooklyn.

Discussion:

As proposed, the "QT" would provide local Brighton Line service as far as Coney Island during peak periods. The "QT" would follow the "RR" route north of DeKalb Avenue to operate local along the Broadway Line to a terminus at 57th Street/Seventh Avenue. The peak period "M" would terminate at Broad Street, Manhattan..

Advantages:

- o The "QT" would provide direct service to Downtown Brooklyn and Lower Manhattan for 10,600 Brighton Line riders.
- o The "QT" provides more frequent direct service to the Broadway Line in Midtown for 6,200 Brighton Line riders than the "QB" operating alone.

Disadvantages:

- o The "QB" and "D" provide faster service to Midtown. North of Canal Street, the "QT" duplicates the "QB" service at express stops and the "QT" involves more travel time.
- o Direct peak period service between the Brighton Line and the Nassau Street Line service would be eliminated for 9,924 Brighton Line riders.
- o If the "M" was eliminated during the peak period, it should be also eliminated during the midday to maintain a consistent service pattern on the Brighton Line; an off-peak service to the Broadway Line would be required. With the off-peak "M" eliminated, there

would be no direct off-peak service between the Brighton Line and the Nassau Street Line for 656 off-peak riders between 11AM and 2PM.

Alternative 5:

Operate an express service on the West End Line, designated as the "TR".

Discussion:

As proposed, the "TR" would operate express along the West End Line, with stops at Coney Island, Bay Parkway, 62nd Street and Ninth Avenue. The train would operate express along the Fourth Avenue Line and operate to Sixth Avenue, Broadway, or Nassau Street Lines.

Advantages:

- o The "TR" would decrease running times and increase service for passengers at West End Line express stops.

Disadvantages:

- o 78 percent of all West End Line ridership originate at the local stops skipped by the "TR".

Alternative 6:

Expand "QB" service to operate between 57th Street/Seventh Avenue, Manhattan, and Coney Island, Brooklyn, in both directions at all times (except nights). Reduce peak period "M" service to the Brighton Line to operate in the direction of peak traffic only and eliminate off-peak "M" service south of Broad Street, Manhattan.

Advantages:

- o The expanded "QB" would better serve passengers who currently transfer to the "N" or "RR" at DeKalb Avenue or walk from the Sixth Avenue Line stations in Midtown to destinations that are closer to Broadway Line express stops (see destination zone analysis in Table 27).

Disadvantages:

- o Direct off-peak service between the Brighton Line and Court Street and Lawrence Street would be eliminated, affecting 610 midday passengers (11AM to 2PM).
- o Off-peak service to Lawrence Street and Court Street would be decreased.

- o With the off-peak "M" eliminated, there would be no direct off-peak service between the Brighton Line and the Nassau Street Line for 656 off-peak riders between 11AM and 2PM.
- o Off-peak "Q8" would shift the ratio of bridge-to-tunnel services at DeKalb Avenue from 3:2 to 4:1, a service ratio that is not supported by identified demand.

Proposed Alternatives

After weighing the advantages and disadvantages of each alternative, Alternative #3 was proposed for further consideration. Under this proposal, the following service pattern would be operated on the Southern Division:

- "8" (Sixth Avenue Express) remains unchanged, except that all "8" trains will operate to and from Coney Island, Brooklyn.
- "D" (Sixth Avenue Express) remains unchanged.
- "M" (Nassau Street Local) remains unchanged.
- "N" (Broadway Express) remains unchanged.
- "Q8" (Broadway Express) remains unchanged.
- "RR" (Broadway Local) remains unchanged, except that the alternative "RR" service, designated as the "RJ" (Nassau Street Local), operates between Chambers and 95th Street/Fourth Avenue would be eliminated.
- "T" (Nassau Street Local) operates during peak periods between Chambers Street, Manhattan, and Bay Parkway (West End Line), Brooklyn, in the direction of peak traffic.

Alternatives Within The Manhattan CBD

The boundary of the Manhattan CBD delineates the peak load points for most subway routes. The RTSSS alternatives are based on identified demand for service from corridors outside the CBD. This is because the rapid transit system must function most efficiently where it carries the most people--entering or exiting the CBD. For most trips entirely within the Manhattan CBD, the dense network of routes in Midtown and Lower Manhattan provides direct service without the need for transfers.

The New York City Department of Transportation and the National Resources Defense Council requested consideration of an intra-Manhattan service connecting Sixth Avenue Line stations in Midtown with Eighth Avenue Line stations in Lower Manhattan, designated as the "X".

The "X" would operate between 57th Street/Sixth Avenue and the World Trade Center Terminal. It would operate on the Sixth Avenue Line north of West Fourth Street and on the Eighth Avenue Line south of West Fourth Street; due to track configuration the "X" would operate local on both lines. The service would move between the Sixth and Eighth Avenue Lines via the West Fourth Street Interlocking---a movement that is currently only made by the JFK Express at 20-minute headways. As making such a move at greater frequency could create congestion at West Fourth Street, the "X" is proposed as an off-peak only service to maintain the peak reliability of the other services through West Fourth Street ("A", "B", "CC", "D", "E", "F" & JFK Express).

57th Street/Sixth Avenue Station is located in a high-density district of commercial, retail, and luxury residential and hotel land uses. The World Trade Center Terminal provides direct access to the World Trade Center complex and is surrounded by the high-density commercial land uses of the Financial District. Intermediate stops serve the Rockefeller Center complex (47-50th Streets/Sixth Avenue), the Herald Square retail district (34th Street/Sixth Avenue), and the residential areas of Chelsea, Greenwich Village, Soho, and TriBeCa.

Transfers between the "X" and other rapid transit services are provided at 47-50th Streets/Sixth Avenue (to the Queens Boulevard and Central Park West Lines), at 42nd Street/Sixth Avenue (to the Flushing Line), at 34th Street/Sixth Avenue (to the Broadway Line and PATH), at 14th Street/Sixth Avenue (to the Seventh Avenue and 14th Street-Canarsie Lines) at West Fourth Street (to the services previously mentioned, and at the World Trade Center Terminal (to the Seventh Avenue Line and PATH). Table 28 summarizes the identified weekday travel demand between 11AM and 2PM for the "X" service.

TABLE 28
MIDDAY "X" DEMAND
(11AM to 2PM)



From:	To: 57St/6Av	50St/6Av	42St/6Av	34St/6Av	23St/6Av	14St/6Av	(West4St)	Spring St	Canal St	Chambers /WTC	TOTALS
57St/6Av											
50St/6Av							-	0	6	5	11
42St/6Av							-	12	88	280	380
34St/6Av							-	35	58	98	191
23St/6Av							-	0	9	52	61
14St/6Av							-	0	16	35	51
(West4St)	-	-	-	-	-	-	-	0	0	41	41
Spring St	5	49	15	12	6	4					91
Canal St	0	10	50	17	0	49					126
Chambers /WTC	53	162	134	20	0	9					378
TOTALS	58	221	199	49	6	62		47	177	511	1330

THIS DEMAND SERVED
BEST BY "X" SERVICE

Advantages:

- o The "X" would provide an off-peak service connecting Sixth Avenue Line stations in Midtown with Eighth Avenue Line stations in Lower Manhattan, benefitting 1330 weekday passengers between 11AM and 2PM who currently must transfer at West Fourth Street.

Disadvantages:

- o The "X" would duplicate other rapid transit services currently operating in Midtown:
 - Seventh Avenue Line local service (#1) to Cortlandt Street/World Trade Center.
 - Seventh Avenue Line express services (#2 & #3) to Park Place/World Trade Center.
 - 53rd Street Line service ("E") to Chambers Street/World Trade Center.
 - Eighth Avenue Line local and express services ("A", "AA", "E") to Chambers Street/World Trade Center.
 - Broadway Line local service ("RR") to Cortlandt Street/World Trade Center.

The M6 bus also operates on Broadway and Sixth Avenue between Midtown and the World Trade Center area.

- o The "X" service would compete with the existing Sixth Avenue Line services ("B", "D" & "F") for passengers. Passenger travel patterns observed during the study suggest that riders within the CBD will habitually board the first available train which will move them towards their destination, rather than wait for a train that will provide direct service to their destination. Based on this "first train" habit, two-thirds of the passengers at Sixth Avenue express stations and one-half of the passengers at Sixth Avenue local stations who would benefit from the "X" service would be diverted to other services.
- o The southbound "X" would arrive at the lower level platforms of West Fourth Street while other services to the World Trade Center arrive at the upper level. This would result in passenger confusion and inconvenience.
- o The "X" would create an confusing service pattern for local Sixth Avenue Line service, because peak period, evening, weekend and night service to 57th Street/Sixth Avenue would have to be provided by other services (there is no identified passenger demand to justify "X" service during evening and weekends).

Proposed Alternatives

The disadvantages associated with the "X" service outweigh its benefits. As a result, the "X" was not proposed for further consideration.

Review of Potential Capital Improvements

The RTSSS guidelines for route and service changes specified that proposals were "to remain within the current... physical plant for rapid transit operations". Minor alterations in track and switch alignments were identified, however, that could permit new routings that are not currently feasible. The cost-effectiveness of these alterations has not been evaluated, as that is beyond the scope of the Study; they can not be proposed for implementation without further study.

Overall, nine minor alterations were identified and are listed below (and shown in Figures 44A to 44I). Three of the alterations (#1, #3 and #8) would permit operating a service determined by the Study to be desirable. The other five alterations would permit new routings that were not analyzed because they were not currently feasible.

- A. Culver Line - Fourth Avenue ("F", "GG")
Convert existing Switch #11 into a diamond crossover permitting direct movement from Track B3 to Track B4. This would permit the "GG" to relay on either Track B3 or B4, leaving one track clear to operate the "F" express service in the direction of peak traffic. Currently, the "GG" can relay only on Track B3 or operate to Church Avenue to relay.
- B. IRT Brooklyn Line - Utica Avenue (#3, #4)
Install two switches, connecting the end of Track M to Track 1 at approximately Station 340+00, and connecting Track 4 at approximately Station 331+00 to the end of Track 3. This would permit turning local trains at Utica Avenue and through running express trains to New Lots Avenue. Local trains would relay via Tracks 1, M, and 4. Express trains would operate southbound via Tracks 2, M, and 1, and northbound via Tracks 4 and 3. Currently, operating the express to New Lots Avenue and turning the local at Utica Avenue would require both services to merge in both directions.
- C. Queens Boulevard Line - Queens Plaza ("E", "F", "GG", "RR")
Install two new switches at approximately Station 1246+00, permitting direct movement from Track D3 to D1. This would simplify the movements involved in turning the "GG" at Queens Plaza when the "RR" runs to Forest Hills at all times, as proposed. Currently, turning the "GG" would entail merging first with the "RR", then with the "E" and the "F", relaying on Track D5, then merging again with the "E" and "F", and finally with the "RR" again. These switches would eliminate the double merger with the "RR".





Track Diagram



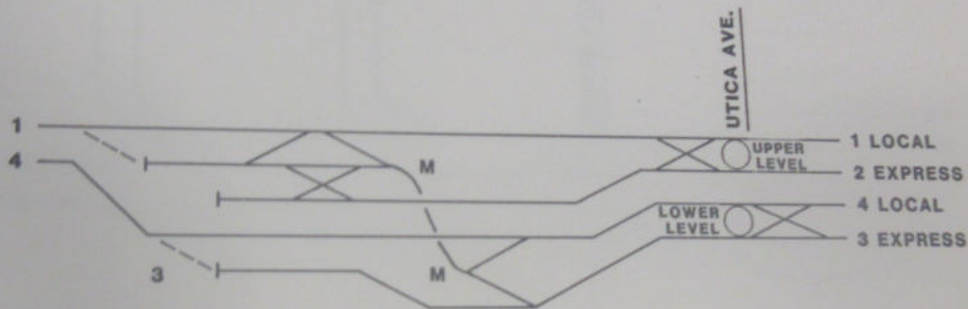
FIGURE

44B



New York City
Transit
Authority

NEW LOTS LINE
SWITCH FROM TRACK M TO TRACK 1
SWITCH FROM TRACK 4 TO TRACK 3





Track
Diagram



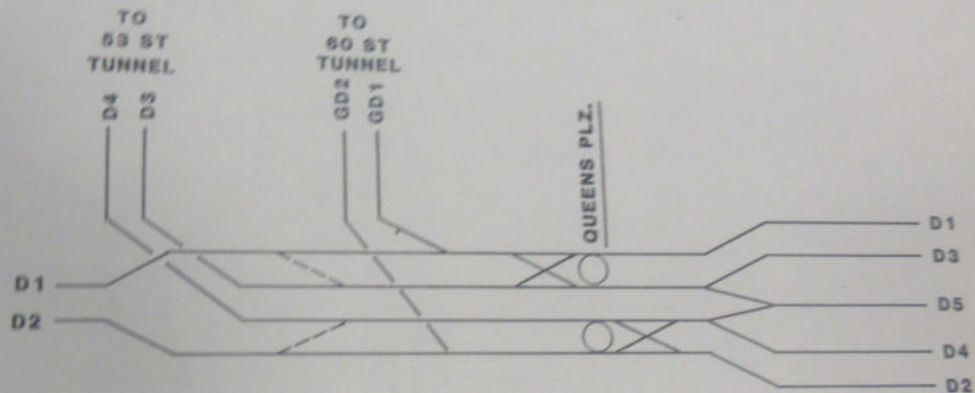
FIGURE

44C



New York City
Transit
Authority

QUEENS BLVD. LINE
SWITCH FROM TRACK D2 TO D4/SWITCH FROM
TRACK D3 TO D1



- D. Rockaway Line - Howard Beach ("A", "CC", "JFK")
 Move the Howard Beach interlocking plant 1500 feet north, or install a new switch that would permit direct movement from Track F3 to Track F2 at Station 511+99 (crossing Track F4). This would permit relaying the "JFK Express" at Howard Beach in a minimum amount of time. Currently, the "JFK" must "wrong rail" southbound between Switch #251 and Howard Beach---about 7000 feet---in order to relay, blocking northbound "A" and "CC" traffic. This would also permit continuing to stop the southbound "JFK" at the northbound platform if the "JFK" was extended south.
- E. Fulton Street Line - Lafayette Avenue ("A", "CC", "JFK")
 Install a switch at Lafayette Avenue interlocking to permit a direct movement from Track A3 to A5. This would permit the short turning of an additional off-peak service from Lower Manhattan operating through the Cranberry Street Tunnel ("A").
- F. Fourth Avenue Line - 59th Street ("N")
 Install a new switch from Track F4 to F3 at approximately Station 520+00. This would permit relaying the "N" Shuttle at 59th Street rather than at 36th Street, saving crew hours and car miles at night (this would not be necessary, however, if the "N" was extended to Astoria at all times as proposed by this study).
- G. Sixth Avenue Line - Broadway-Lafayette ("B", "D", "F")
 Install a new diamond crossover at approximately Station 932+50 to permit direct movement between Tracks B1 and B3. This would provide the flexibility to operate a Sixth Avenue express service through the Rutgers Tunnel or to the Eastern Division. This would facilitate a frequent through local service between the Sixth Avenue Line north of West Fourth Street and the Eighth Avenue Line south of West Fourth Street, like the "X" Train discussed in the Intra-Manhattan Corridor section. This would also permit operating southbound Eighth Avenue trains through to the Manhattan Bridge in an emergency, which would greatly improve RTTD's ability to reroute "B" and "D" trains via Eighth Avenue, when there is a service disruption on the Sixth Avenue Line, without requiring the current substantial service disruption to Brooklyn.
- H. Eighth Avenue Line - 50th Street ("A", "AA", "CC")
 Install two new switches at approximately Station 1104+00, permitting direct movement from Track A4 to A2 and from Track A3 to A1. This would simplify the movements involved in operating the recommended off-peak "A" local south of 59th Street. Currently, The "A" must merge with other services at the local 59th Street platform. These switches would permit the "A" to remain discrete through 59th Street.



Track Diagram



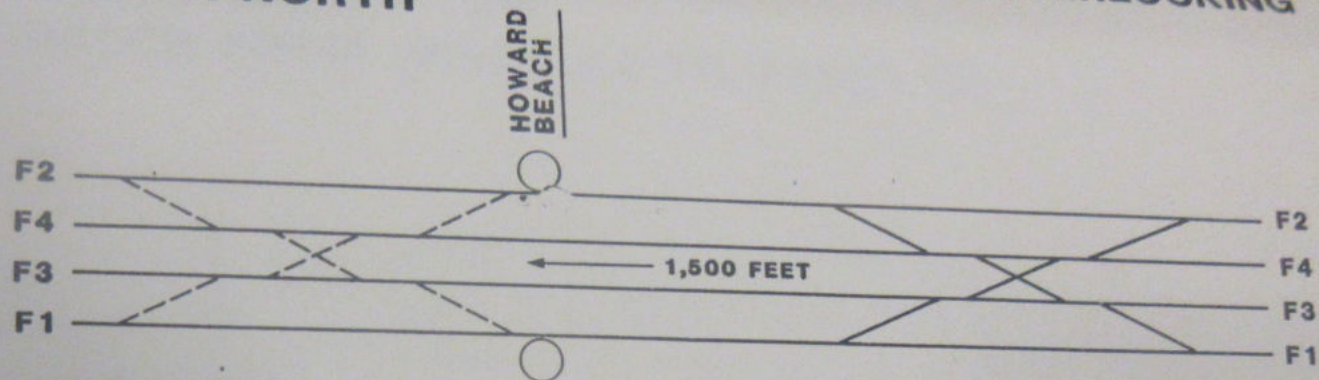
FIGURE

44D

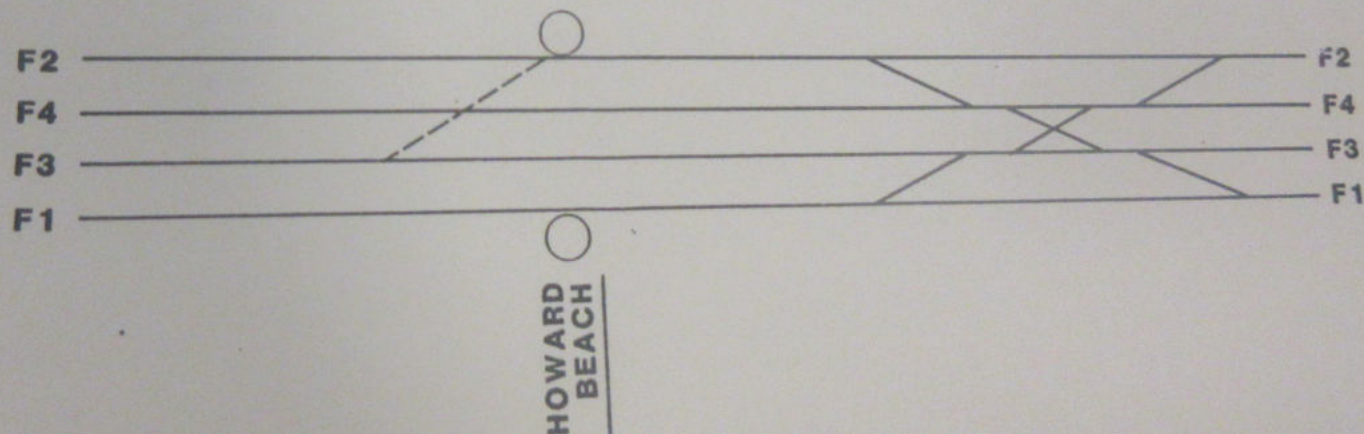


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Authority

ROCKAWAY LINE ALTERNATE "A"- MOVE HOWARD BEACH INTERLOCKING 1,500 FT. NORTH



ALTERNATE "B"- SWITCH FROM TRACK F3 TO TRACK F2





Track Diagram

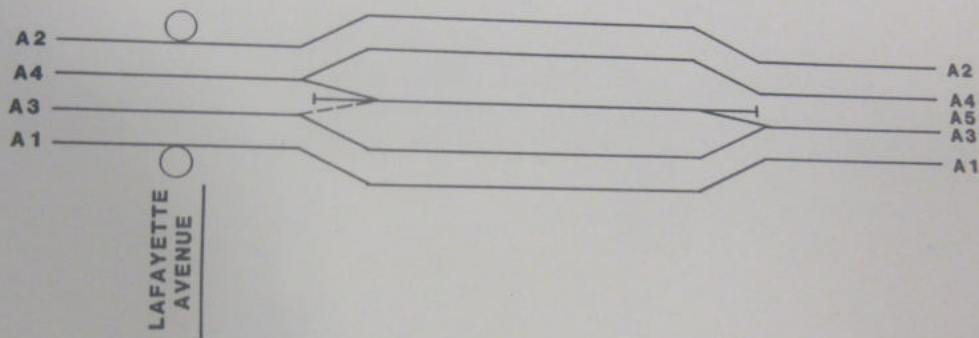


FIGURE
44E



New York City
Transit
Authority

FULTON STREET LINE SWITCH FROM TRACK A3 TO TRACK A5





Track Diagram

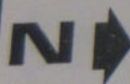
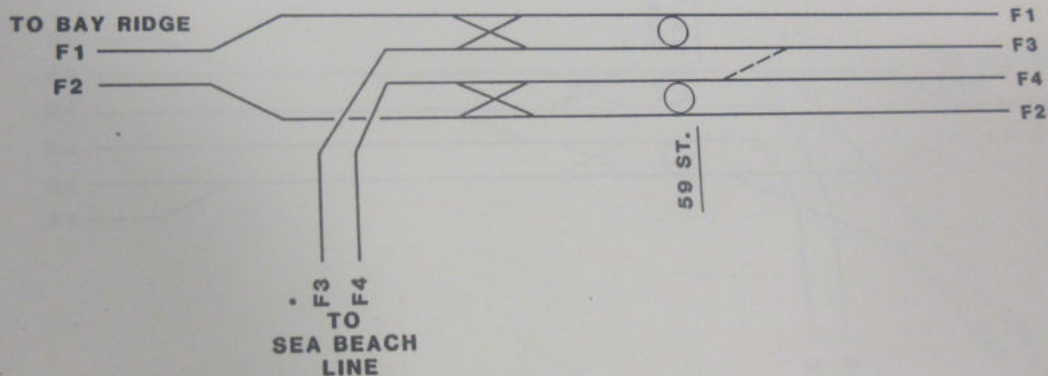


FIGURE
44F



New York City
Transit
Authority

FOURTH AVENUE LINE SWITCH FROM TRACK F4 TO TRACK F3





Track Diagram

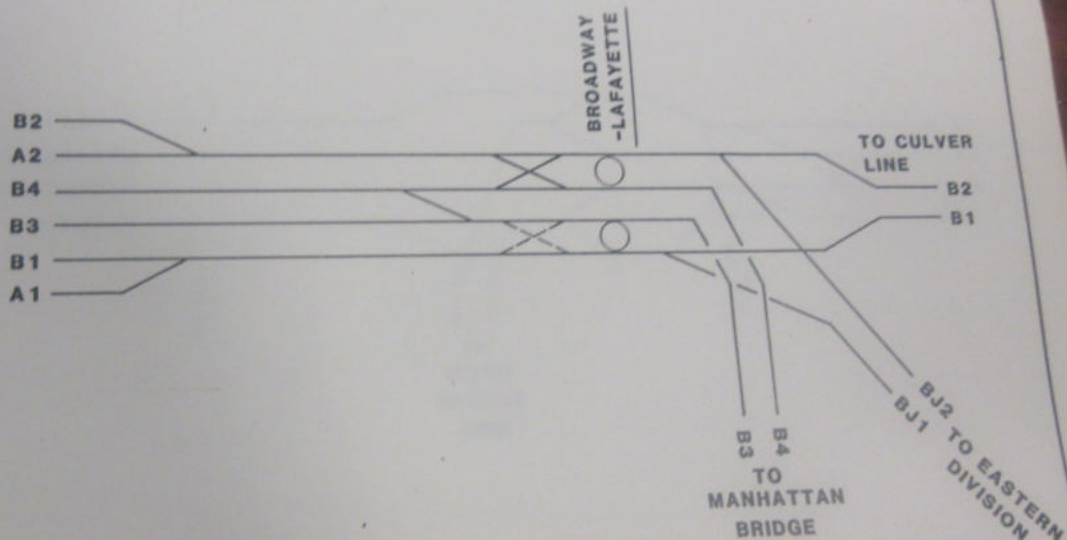


FIGURE
44G



New York City
Transit
Authority

SIXTH AVENUE LINE DIAMOND CROSSOVER BETWEEN B1 AND B3





Track Diagram

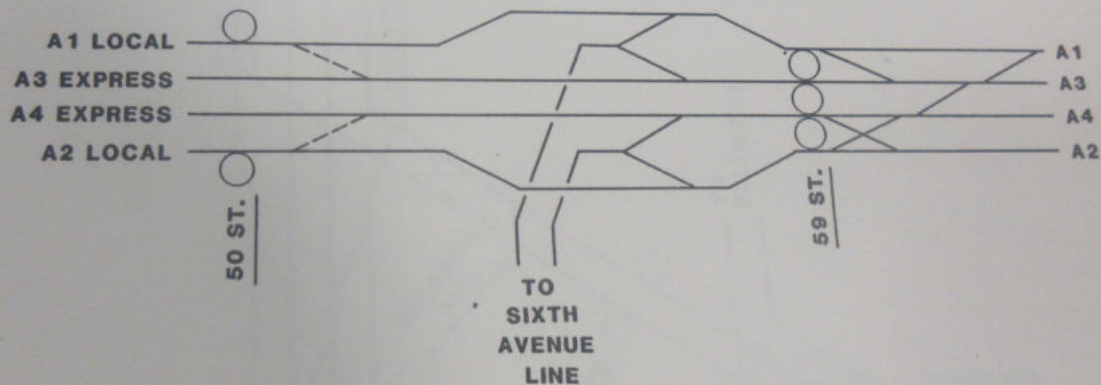


FIGURE
44H



New York City
Transit
Authority

EIGHTH AVENUE LINE SWITCH FROM TRACK A1 TO A3 SWITCH FROM TRACK A4 TO A2





Track Diagram

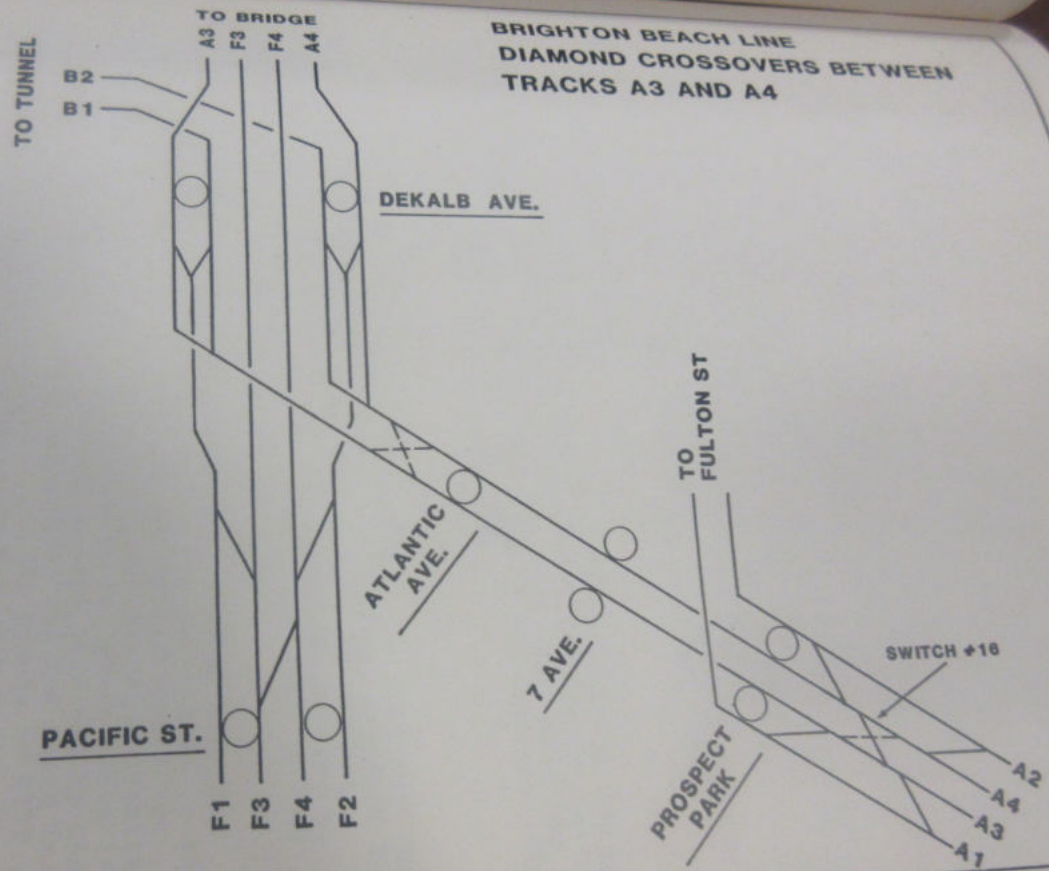


FIGURE

441



New York City
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Authority



1. Brighton Beach Line - Atlantic Avenue and Prospect Park ("D", "M", "QB")
Convert existing Switch #16 at Prospect Park into a diamond crossover and install a new diamond crossover at approximately Station 326+00 (Atlantic Avenue) to permit direct movements between Tracks A3 and A4. Single-track operation between DeKalb Avenue and Prospect Park currently requires a complicated double-relay move southbound or a quadruple-relay move northbound (depending on which track is closed) via Pacific Street. These crossovers would simplify the single-track movements and prevent disruption of other services at DeKalb Avenue and Pacific Street.

Conversely, they would permit turning northbound Brighton Beach trains at Atlantic Avenue (where IRT connections are provided) if DeKalb Avenue is blocked in an emergency, or southbound Brighton Beach trains at Atlantic Avenue if a train is stalled between there and Prospect Park. Currently, such delays often result in a queue of trains trapped between Atlantic Avenue and Prospect Park.

Operating Cost Estimates*

One of the RTSSS guidelines for route and service changes specified that the proposals were to remain within the current operating budget for rapid transit service. Net operating costs, therefore, were derived for each of the four corridors proposed for route and service changes.

Costing Methodology

The route and service change proposals for each corridor were translated into model operating schedules, based on the identified demand for the proposed service and current operating practice. The identified demand was derived by applying travel patterns from the RTSSS data base to 1982 turnstile registrations and traffic checks.

The model operating schedules were compared with the present operating schedules to derive the net change in annual car-miles, peak train requirements and daily round trips operated. Applying established costs per car-mile resulted in the net change in car maintenance costs and power costs (the cost factors* used in these estimates were provided by the Rapid Transit Car Maintenance Department and the Rapid Transit Power Department, respectively). The net change in RTTD quota and labor costs* were determined from the peak train requirements or daily round trips operated, depending on the specifics of each proposal. The net annual change in Authority resources (car-miles operated, RTTD quota, and costs*) derived by the RTSSS proposals are shown on Table 29.

* Costs as of March 1983.

TABLE 29
NET ANNUAL RESOURCES
WITH THE RTSS PROPOSALS



	CAR-MILES	RTTD QUOTA	-----ANNUAL COSTS-----				SUFFICIENCY
			CAR MAINTENANCE	POWER	RTTD LABOR	TOTAL	
<u>Sixth Avenue/Upper Manhattan Proposals:</u>							
"A"- "AA"- "B"	-1,267,000	-60	-\$127,000	-\$322,000	-\$1,626,000	-\$2,075,000	
<u>Queens Boulevard-Astoria Proposals:</u>							
"N"- "RR"- "V"	+1,436,000	+22	+\$144,000	+\$163,000	+\$707,000	+\$1,014,000	
"F"	-720,000	-4	-\$72,000	-\$153,000	-\$137,000	-\$362,000	
"GG"	-270,000	-4	-\$28,000	-\$47,000	-\$129,000	-\$204,000	
"B"	-50,000	-4	-\$5,000	-\$6,000	-\$126,000	-\$137,000	
<u>Eastern Division Proposals:</u>							
"J"- "LL"- "M"	-1,869,000	-4	-\$187,000	-\$599,000	-\$1,743,000	-\$2,529,000	
"K"	+3,524,000	+52	+\$352,000	+\$930,000	+\$3225,000	+\$4,507,000	
<u>Southern Division Proposals:</u>							
"RJ"- "T"	-78,000	0	-\$8,000	-\$6,000	-\$13,000	-\$27,000	
"B"	-37,000	0	-\$4,000	-\$19,000	-\$231,000	-\$254,000	
TOTALS:	+1,605,000	+2	+\$65,000	-\$59,000	-\$73,000	-\$67,000	

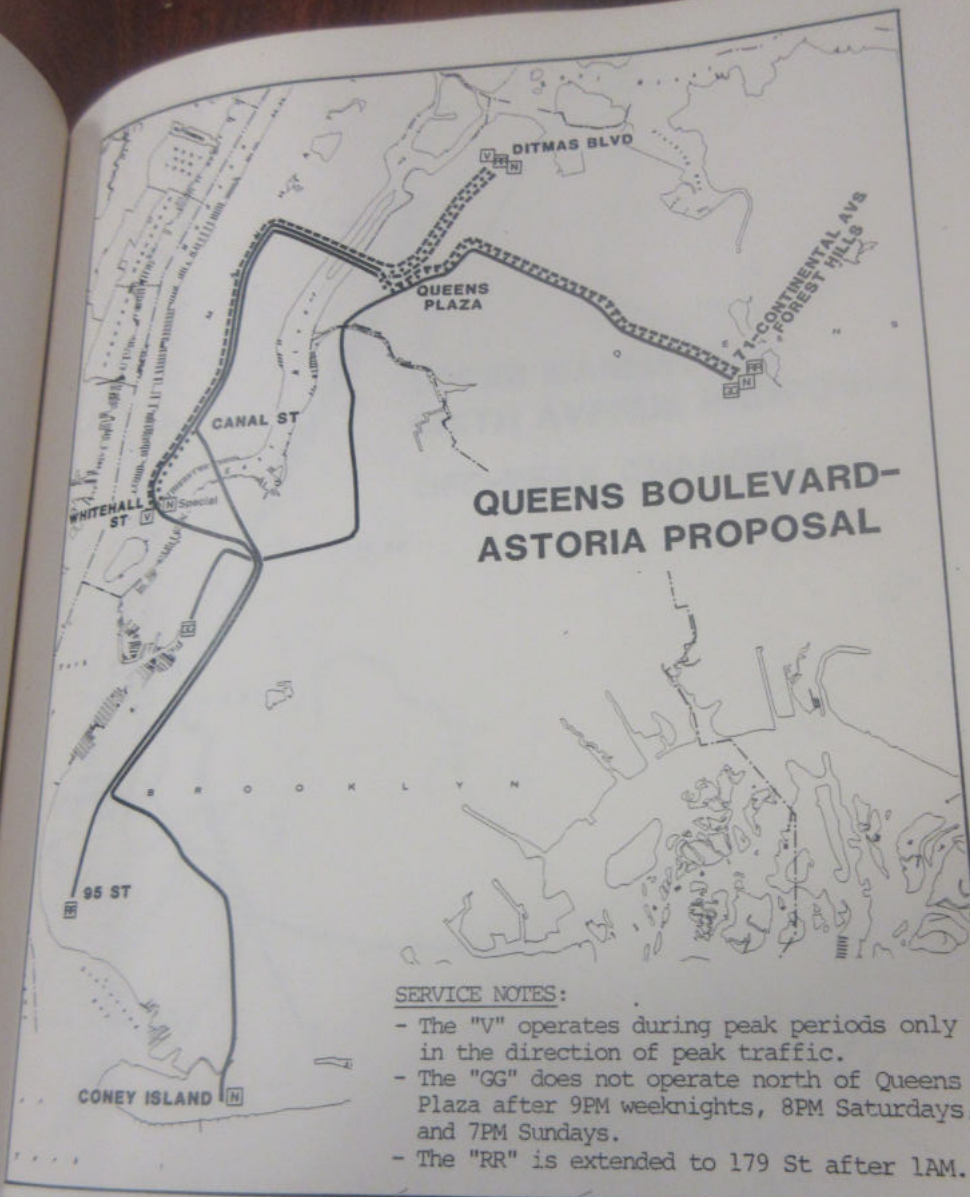
Proposed Route and Service Changes

In review, the following route and service changes are proposed, based on the Study data base:

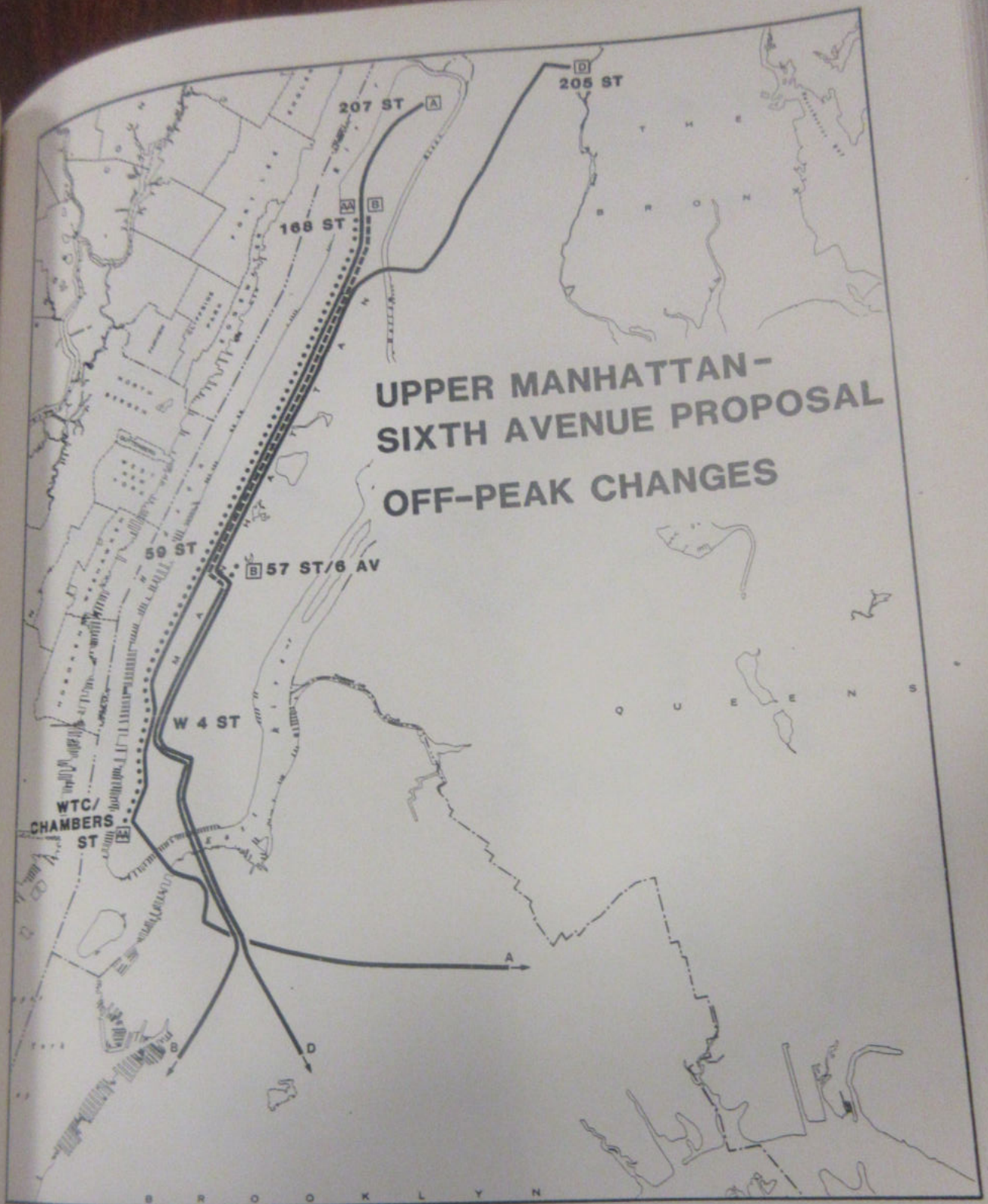
- "A" - Operate the off-peak "A" local between 59 Street/Eighth Avenue and Chambers Street.
- "AA" - Replace the "AA" with the extended "B" north of 59 Street/Eighth Avenue, and with the off-peak "A" local service south of 59 Street/Eighth Avenue.
- "B" - Operate the "B" as a Sixth Avenue Express between 168 Street and Coney Island at all times (except nights).
 - Replace the "B" night shuttle to 57 Street/Sixth Avenue with the "F".
- "D" - Operate the "D" local on Sixth Avenue at nights (between 1AM and 5AM).
- "F" - Extend the hours of "F" express service in Queens until 1AM.
 - Turn the "F" at 57 Street/Sixth Avenue at nights (between 1AM and 5AM)
- "GG" - Turn the "GG" at Queens Plaza evenings (9PM weeknights, 8PM Saturdays, 7PM Sundays).
- "J" - Extended peak "J" express service to operate between Marcy Avenue and Eastern Parkway.
 - Replace off-peak "J" service with the "K".
- "K" - Operate the "K" local between 57 Street/Sixth Avenue and:
 - Rockaway Parkway (Canarsie) during peak periods.
 - Queens Blvd-Jamaica Avenue, all other times (except nights).
- "LL" - Originate or terminate some peak period trips at Atlantic Avenue.
- "M" - Extend the "M" to Broad Street during evenings and weekends (except nights).

- "N" - Operate the "N" as a Broadway Express between Astoria and Coney Island at all time ("N" night shuttle on the Sea Beach Line is no longer required).
- All "N" trains stop at 49 Street/Seventh Avenue.
- Replace the "N" Whitehall Specials with the "V".
- "RR" - Operate the "RR" as a Broadway Local between 71-Continental Avenues and 95 Street/Fourth Avenue, at all times.
- Extend the "RR" to 179 Street at all times, when the "F" turns at 57 Street/Sixth Avenue.
- Replace the "RR" Chambers Street Specials ("RJ") with the "T".
- "T" - Operates local between Chambers Street and Bay Parkway/86 Street during peak periods in the peak direction.
- "V" - Operate the "V" as a Broadway Local between Astoria and Whitehall Street during peak periods in the peak direction.

Implementation of these route and service changes must be weighed against the other priorities of the Authority, in particular the restoration of the physical plant to a state of good repair.



<p>RAPID TRANSIT SERVICE SUFFICIENCY STUDY</p>	<h2 style="text-align: center;">Route Change Proposal</h2> <p>Part of Route Unchanged —————</p> <p>Added - - - - -</p> <p>Deleted</p>	<p style="text-align: center;">N</p>	<p style="text-align: center;">FIGURE</p>
		<p style="text-align: center;">New York City Transit Authority</p>	



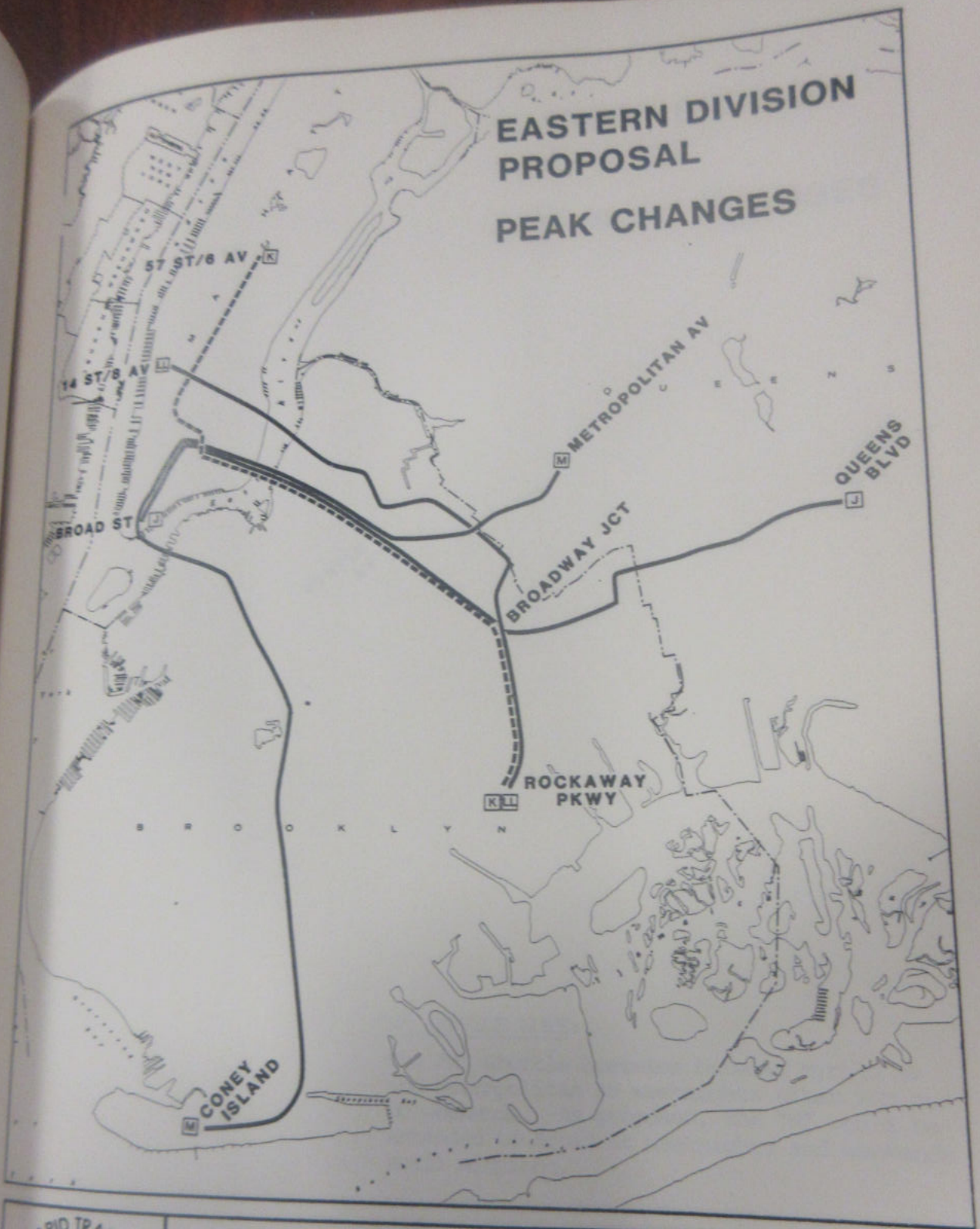
Route Change Proposal

Part of Route Unchanged —————
 Added - - - - -
 Deleted



New York City
Transit
Authority

FIGURE



Route Change Proposal

Part of Route Unchanged —————
 Added - - - - -
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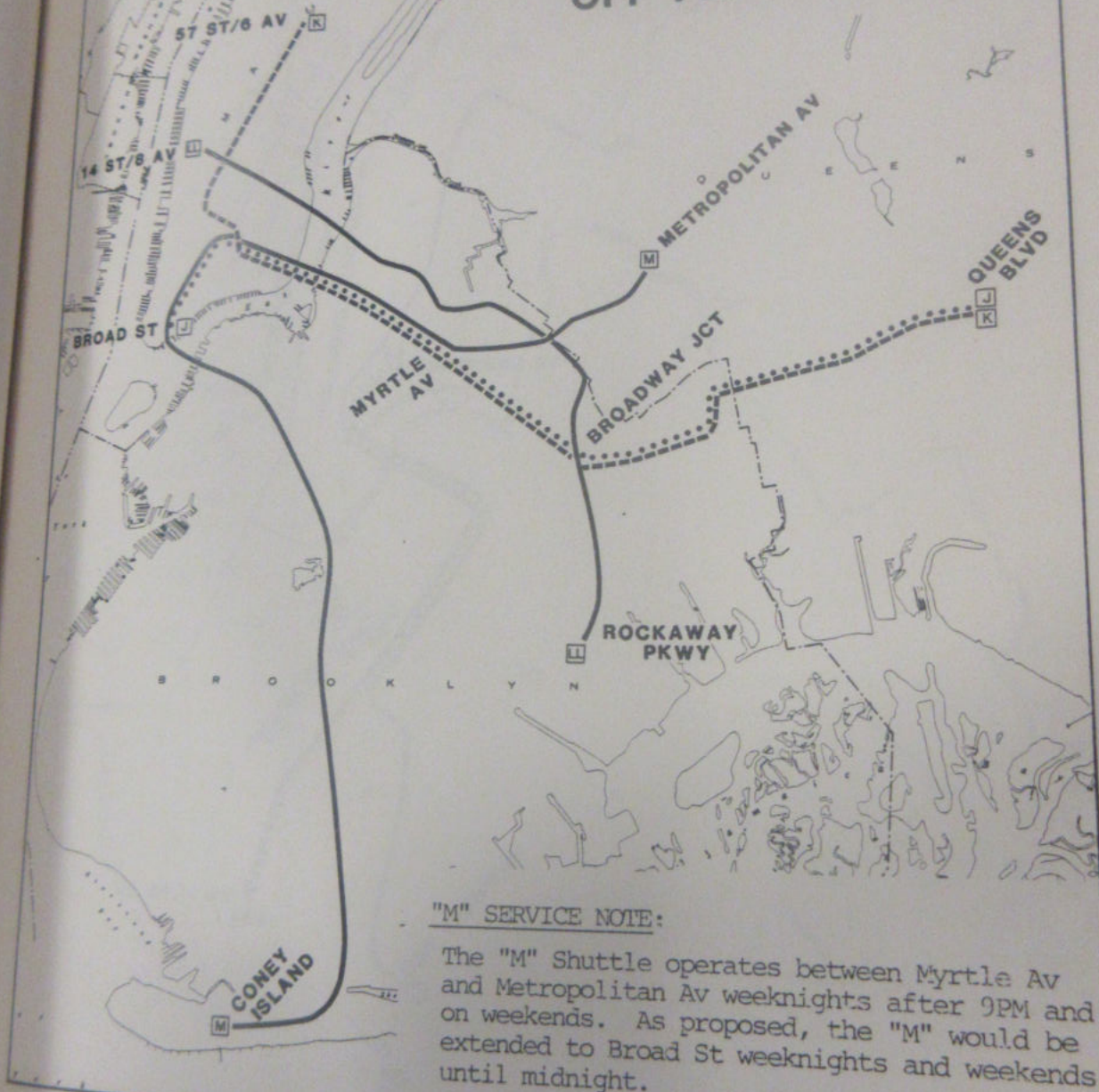


FIGURE



New York City
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Authority

EASTERN DIVISION PROPOSAL OFF-PEAK CHANGES

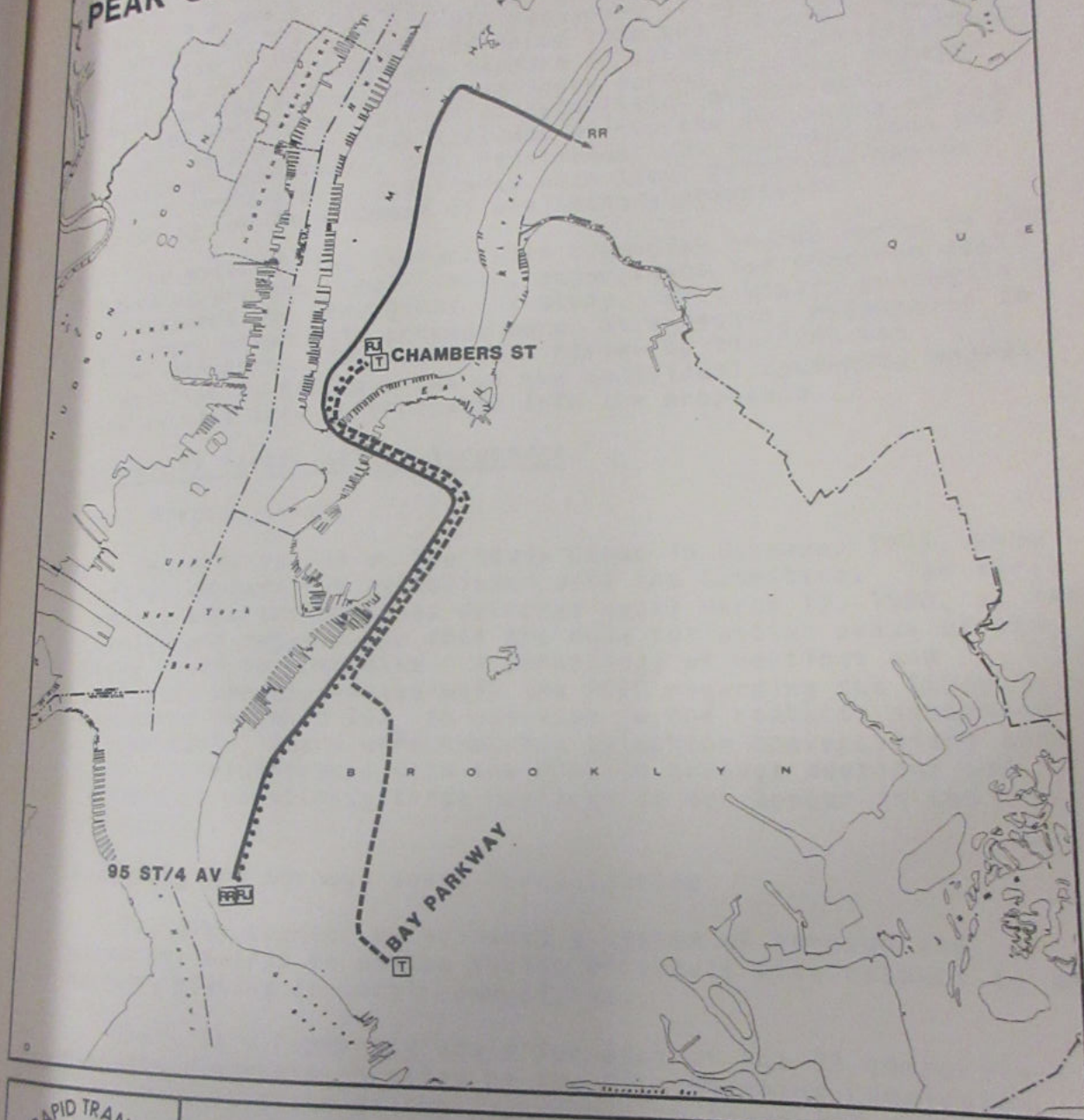


"M" SERVICE NOTE:

The "M" Shuttle operates between Myrtle Av and Metropolitan Av weeknights after 9PM and on weekends. As proposed, the "M" would be extended to Broad St weeknights and weekends until midnight.

	<h3>Route Change Proposal</h3> <p>Part of Route Unchanged —————</p> <p>Added - - - - -</p> <p>Deleted</p>	<p>FIGURE</p>
		<p>New York City Transit Authority</p>

SOUTHERN DIVISION PROPOSAL PEAK CHANGES



Route Change Proposal

Part of Route Unchanged ———
 Added - - - - -
 Deleted



FIGURE



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COMMUNITY PARTICIPATION

One objective of the Rapid Transit Service Sufficiency study was to increase community participation in the Authority's service planning process. Contractually, the Authority was required to "rely on the MTA Permanent Citizens' Advisory Committee (PCAC) to provide input into the [Study]...for the purpose of providing some measure of citizens' participation". Based on the Authority's experience during previous borough studies and in recognition of established mechanisms for community participation included within the structure of the municipal government, this requirement was expanded upon and direct contact was established with local community boards prior to the development of preliminary proposals.

By establishing contact with community boards early in the planning process, their ideas, suggestions and concerns could be accommodated throughout the Study. Preliminary proposals developed under this process were, as a result, responsive to local concerns. The subsequent review by the PCAC was simplified as the opinions of the individual community boards had already been incorporated into the proposals.

Community Participation Structure

PCAC Participation

The PCAC review of the Study began in December 1978, when initial contact was established with the Committee. The first meeting with the PCAC was deferred until March 10, 1980, at the Committee's request, so that the data collection phase of the Study could be completed. A chronology of meetings and ancillary correspondence with the PCAC regarding the Study is presented on Table 30. In addition to the contacts presented in the table, there were numerous telephone conversations and minor correspondences with the PCAC to arrange meetings and coordinate positions; these contacts do not appear in the chronology.

Community and Borough Board Participation

The City Charter established a system of borough and community boards to advise public officials with respect to any matter relating to local communities.

There is a community board for each of the 59 community planning districts, created by the City Planning Commission. Each board consists of the councilman-at-large and district councilmen representing the planning district, and up to fifty persons appointed by the Borough President. In addition, there are five borough boards consisting of the Borough President, all councilmen representing the borough, and the chairpersons of all the community boards within the borough.



TABLE 30
PCAC CHRONOLOGY

- 12-13-78 Letter from MTA to the MTA/PCAC requesting their input to the study.
- 3-10-80 Initial meeting with the MTA/PCAC. The study purposes and objectives were presented and the community participation process was outlined.
- 3-11-80 MTA/PCAC "Speak Out" Public meeting in Staten Island.
- 5-6-80 Letter to the MTA/PCAC requesting their assistance in selecting stations for the station access study.
- 5-6-80 MTA/PCAC "Speak Out" public meeting in Queens.
- 5-30-80 Meeting with the MTA/PCAC to discuss station access and preliminary routing issues.
- 6-25-80 Meeting with Stephen Dubrow, MTA/PCAC secretary, to further discuss routing issues raised at the May 30, 1980 meeting.
- 8-11-80 Letter to the MTA/PCAC providing a status report on study progress.
- 10-23-80 MTA/PCAC "Speak Out" public meeting in Brooklyn.
- 11-10-80 Meeting with the MTA/PCAC to discuss station access, service planning guidelines and the preliminary results of the origin-destination survey.
- 1-29-81 MTA/PCAC "Speak Out" public meeting in Manhattan.
- 8-16-82 Meeting with the MTA/PCAC to present the status of the preliminary proposals and to review community response to the proposals. MTA/PCAC concerns regarding specific proposals were discussed.
- 8-25-82 Memo to the MTA/PCAC regarding an alternative "X" service and service standards.
- 8-30-82 Letter from the MTA/PCAC summarizing their concerns expressed at the August 16, 1982, meeting.
- 9-30-82 Joint meeting with the Brooklyn Borough President's Transportation Committee and the MTA/PCAC to discuss routing issues in Brooklyn.



TABLE 30
PCAC CHRONOLOGY
(continued)

- 10-4-82 Letter to the MTA/PCAC in response to their letter of September 20, 1982, suggesting further discussion at the MTA/PCAC's October meeting.
- 10-14-82 Meeting with the MTA/PCAC to discuss the Committee's concerns regarding the preliminary proposals and the lack of "A" division alternatives.
- 11-5-82 Letter to Philip Weinberg, MTA/PCAC Chairman, in response to his proposal for alternative service on the Jerome Avenue Line, raised at the October 14, 1982 meeting.
- 11-16-82 Meeting with the MTA/PCAC to further discuss the committee's concerns. The MTA/PCAC requested that a special matrix be created to show the benefits and disbenefits of each proposal in tabular form.
- 11-18-82 Letter from the MTA/PCAC noting NYCTAAC approval of the Queens Boulevard-Astoria proposals, pending receipt of the special matrix requested by the MTA/PCAC.
- 11-24-82 Letter to the MTA/PCAC forwarding the special matrix they requested as well as the Queens Boulevard-Astoria Package for Senior Management.
- 12-28-82 Letter from the MTA/PCAC responding favorably to the special matrix.
- 1-24-83 MTA/PCAC releases a status report regarding the Rapid Transit Service sufficiency study.
- 2-16-83 Letter to the MTA/PCAC responding to the issues raised in its January 24, 1983, status report.
- 3-1-83 Letter to the MTA/PCAC forwarding special matrices and senior management packages for the Southern Division proposals and the Washington Heights, Central Park West, Eastern Division and Sixth Avenue proposals.

The community participation methodology for the Study was designed to utilize this established system of boards, in addition to working directly with the PCAC.

Community Participation Methodology

Meetings were planned throughout the Study with the borough and community boards, as well as with various combinations of board groups and subgroups. The five types of meeting and their purpose were:

- o Borough Board Meetings. Before any proposals were developed, presentations were made to all five borough boards (Staten Island and the Bronx Borough Boards were involved only in these initial borough board meetings as subsequent proposals did not directly affect those boroughs). These presentations familiarized the boards with the goals, objectives and methodology of the Study and solicited initial community input from the member community boards and elected officials. Subsequent meetings with the borough boards were held to discuss issues that were common to many community boards or involved the entire borough.
- o Borough President's Transportation Committee Meetings. In order to discuss issues common to many community boards, the Brooklyn and Queens Borough Presidents organized committees composed of the transportation committee chairpersons of all the community boards in each borough. Private individuals with a borough-wide interest in transportation issues were also designated by the Presidents to join. Presentations were made at one meeting of the Queens committee and at two meetings of the Brooklyn committee prior to the development of preliminary proposals. After the preliminary proposals were developed, a meeting was held with each of the committees to solicit opinions of community board representatives.
- o Joint Committee Board Meetings. Seven joint meetings were held with the combined representatives of several community boards, grouped by geography or common service issues, in Brooklyn (two meetings), Queens (two meetings), and Manhattan (three meetings). The concept of joint community board meetings was initially chosen over meetings with individual community boards in order to expedite the community participation process and economize study costs---several issues could be combined at a single joint meeting and the opinions of community boards that were marginally affected by the Study could be represented in the process in a cost-effective manner. The joint meetings also brought boards that benefitted by

proposals together with boards that were disbenefitted, permitting advocates for both sides of an issue to interact at a single meeting.

The purpose of these joint meetings were:

- to represent the preliminary proposals to the community, along with supportive written materials;
- to explain the effect of the proposals on the riders represented by each community board;
- to answer questions regarding the proposals (this led to many other questions being raised that did not relate to the Study---these questions were either answered or forwarded to the appropriate department within the Authority); and
- to solicit opinions concerning the proposals from the individual community boards.

o Community Board Meetings. Presentations were made at individual community board meetings upon request. In many cases, the request came from boards that did not have a representative present at a joint meeting. In other cases, boards required a presentation to the entire board, a public meeting, or both in order to pass a resolution regarding the proposals. The purpose and format of these presentations followed that outlined for the joint meetings.

o Community Board Transportation Committee Meetings. Most individual community boards have a standing transportation committee (though the title may vary) to review transportation matters and make recommendations for action by the full community board. Meetings were held with the transportation committees as necessary throughout the Study in order to coordinate the preliminary proposals and to clarify issues raised by the community boards. While the purpose of the committee meetings was similar to that of the joint and individual board meetings, they generally provided a more productive environment for discussion, as the committees are usually composed of small groups of board members familiar with transportation issues. Further, as community boards often rely on the recommendations of their transportation committees to resolve transit matters, most differences of opinion could be worked out on the committee level, minimizing the need to meet with full boards.

In addition to this series of meetings, the Manhattan Borough President sent a letter to the Manhattan Community Boards at the Authority's request on May 23, 1980, describing the objectives of the Study and asking for the boards' participation in the planning process.

In summary, the general procedures for presenting the preliminary service change proposals and soliciting community response was as follows:

- o Familiarize the community boards with the purpose and methodology of the Study through borough board meetings and the mail.
- o Present the preliminary proposals at borough board meetings and at joint community board meetings; the written materials distributed at these meetings were also mailed to any board affected by the proposals, but were not represented at the meetings.
- o Present the preliminary proposals at individual community board meetings and committee meetings.
- o Follow up on request for a resolution concerning the proposals from any community board that is affected by a service change proposal, but did not respond during the community participation process.

Community Participation Chronology

The following chronologies describe the participation of each community board. The chronologies are divided into groupings based in the four corridors recommended for service changes by the alternatives analysis. The involvement of each community board is detailed as it relates to a particular service change proposal; since some boards are affected by more than one proposal, the description of these boards' participation may be detailed in more than one section.

In addition to the described participation, there were numerous telephone conversations with community board representative where concerns were discussed and business matters, such as setting up meeting, were arranged. While these conversations were an integral part of the planning process, they are not listed in the following chronologies.

1. Sixth Avenue-Upper Manhattan Proposals

The Sixth Avenue-Upper Manhattan proposals would alter the present "A", "AA" and "B" services. A summary of these service changes follows:

- "A" - Operate the off-peak "A" local between 59 Street/Eighth Avenue and Chambers Street.
- "AA" - Replace the "AA" with the extended "B" north of 59 Street/Eighth Avenue, and with the off-peak "A" local service south of 59 Street/Eighth Avenue.
- "B" - Operate the "B" as a Sixth Avenue Express between 168 Street and Coney Island at all times (except nights).

As shown in Figure 46, the following community boards were determined to be affected by this proposal:

Manhattan Community Boards #1, 3, 4, 5, 7, 9, 10 & 12.

An initial presentation was made prior to the development of preliminary proposals to the Manhattan Borough Board on October 30, 1979. The Manhattan Borough President sent a letter to the Manhattan Community Boards at the Authority's request on May 23, 1980, describing the objectives of the study and asking for their participation in the planning process.

After the preliminary proposals were developed, a joint meeting was held on November 23, 1981, to include Manhattan Community Boards #4 and 5, on November 30, 1981, to include Manhattan Community Boards #1 and 3, and on December 1, 1981, to include Manhattan Community Boards #7, 9, 10 and 12. The involvement of each individual Community Board in these meetings, as well as their subsequent involvement in the community participation process, is outlined in chronologies that follow this page.

In summary, of the nine community boards affected by the Sixth Avenue-Upper Manhattan proposals, six community boards responded favorably, one community board did not respond favorably and two community boards had no comment. Five of the boards that responded favorably did so only after the preliminary proposals were modified to operate the offpeak "A" local south of 59 Street, replacing the "AA" service. Manhattan Community Board #1 did not favor the proposal as it opposed eliminating "AA" service in Lower Manhattan.

Although it was not initially considered affected, Brooklyn Community Board #11 (Bensonhurst) felt that its constituency would not benefit by this proposal. The board was concerned that extending the "B" to 168 Street will adversely affect service reliability on the West End Line.

2. Queens Boulevard-Astoria Proposals

The Queens Boulevard-Astoria proposals would alter the present "8", "D", "F", "GG", "N" and "RR" and add a new route "V" service. A summary of these service changes follows:

- "8" - Replace the night shuttle to 57 Street/Sixth Avenue with the "F".
- "D" - Operate the "D" local on Sixth Avenue at nights (between 1AM and 5AM).
- "F" - Extend the hours of "F" express service in Queens until 1AM.
- Turn the "F" at 57 Street/Sixth Avenue at nights (between 1AM and 5AM)



Community Boards Affected By The Sixth Avenue-Upper Manhattan Proposal



FIGURE

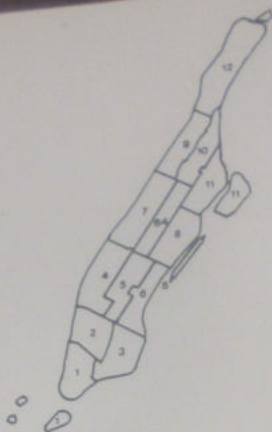
46



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MANHATTAN COMMUNITY BOARD #1
Communities Represented:
Lower Manhattan

Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA"
Stations Affected:
Broadway-Nassau Streets,
Chambers Street, Canal
Street

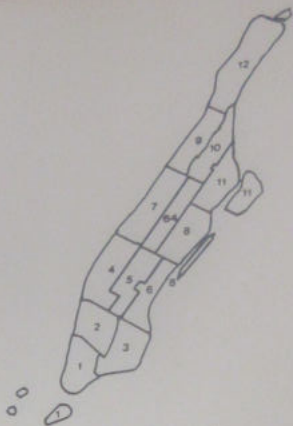


Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 30, 1981 - Joint meeting for Manhattan Community Boards #1, 2 & 3. Board #1 transportation chairperson expressed concern regarding the elimination of the "AA".
- Feb 2, 1982 - Meeting with the Board's transportation committee. The committee expressed concern regarding the elimination of "AA" service, but indicated they would accept an "A" local offpeak.
- Mar 15, 1982 - Community Board sent a letter supporting the Sixth Avenue/Upper Manhattan proposals, but opposing the elimination of "AA" service.

MANHATTAN COMMUNITY BOARD #2
Communities Represented:
West Village, Soho

Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA", "B", "K"
Stations Affected:
Canal Street, Spring
Street, West 4th Street,
14th Street/Eighth Avenue,
Broadway-Lafayette Street,
14th Street/Sixth Avenue

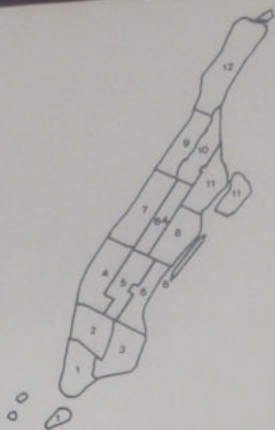


Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 30, 1981 - Joint meeting for Manhattan Community Boards #1, 2 & 3. Board #2 transportation chairperson expressed concern regarding the elimination of "AA" service.
- Mar 18, 1982 - In a telephone conversation, the Board's transportation chairperson requested a meeting to clarify the proposals.
- Mar 23, 1982 - Community Board sent a letter supporting the Sixth Avenue/Upper Manhattan proposals, but opposing the elimination of "AA" service.
- Apr 5, 1982 - Meeting with the Board's transportation committee to discuss the proposals. At its conclusion, the committee voted to support the proposals, as long as the offpeak "A" would operate local in Lower Manhattan.

MANHATTAN COMMUNITY BOARD #4

Communities Represented:
Clinton, Chelsea



Proposal: Sixth Avenue/Upper Manhattan

Services Affected:
"A", "AA", "B", "K"

Stations Affected:
14th Street/Eighth Avenue,
23rd Street/Eighth Avenue,
34th Street/Eighth Avenue,
42nd Street/Eighth Avenue,
50th Street/Eighth Avenue,
59th Street/Sixth Avenue,
14th Street/Sixth Avenue,
23rd Street/Sixth Avenue

Chronology of Participation:

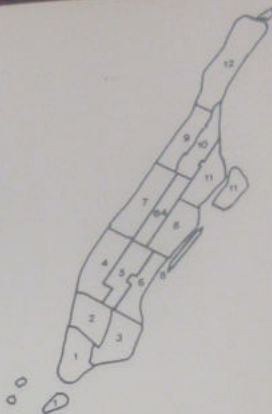
- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 23, 1981 - Joint meeting for Manhattan Community Boards #4, 5, 6 & 8. Board #4 was not represented.
- Dec 8, 1981 - Meeting with the Board's transportation committee to discuss the proposals. At its conclusion, the committee voted to support the proposals, as long as the offpeak "A" would operate local south of 59th Street/Eighth Avenue. The committee requested a presentation at the next board meeting.
- Dec 22, 1981 - Community Board was sent written material detailing the proposals in advance of the next board meeting.
- Jan 6, 1982 - Meeting with the Board to discuss the proposals. At its conclusion, the Board voted to support the proposals, as long as the offpeak "A" would operate local south of 59th Street/Eighth Avenue.
- Jan 20, 1982 - Community Board sent a letter supporting the Sixth Avenue/Upper Manhattan proposals, as long as the offpeak "A" would operate local south of 59th Street/Eighth Avenue.

MANHATTAN COMMUNITY BOARD #5

Communities Represented:
Midtown Manhattan

Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA", "B", "K"

Stations Affected:
14th Street/Eighth Avenue,
23rd Street/Eighth Avenue,
34th Street/Eighth Avenue,
42nd Street/Eighth Avenue,
50th Street/Eighth Avenue,
59th Street/Eighth Avenue,
14th Street/Sixth Avenue,
23rd Street/Sixth Avenue,
34th Street/Sixth Avenue,
42nd Street/Sixth Avenue,
47-50th Street/Sixth Avenue,
57th Street/Sixth Avenue,
Seventh Avenue/53rd Street



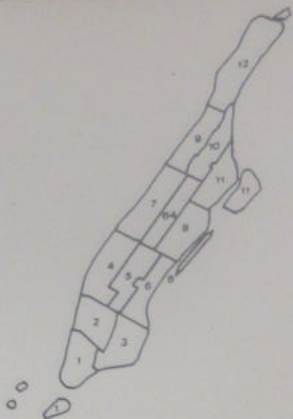
Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 23, 1981 - Joint meeting for Manhattan Community Boards #4, 5, 6 & 8. Board #5 franchise and consent chairperson stated that the offpeak "A" should operate local south of 59th Street/ Eighth Avenue.
- Dec 10, 1981 - Meeting with the Board to distribute materials pertaining to the proposals.
- Jan 6, 1982 - Meeting with the Board's franchise and consent committee to discuss the proposals. The committee supported the proposals, as long as the offpeak "A" would operate local south of 59th Street/Eighth Avenue. The committee requested additional materials pertaining to the proposals.
- Jan 15, 1982 - Community Board was sent the written materials that were requested.
- Feb 19, 1982 - In a telephone conversation, the franchise and consent chairperson requested additional information regarding local "A" train operation during the offpeak.
- Apr 9, 1982 - Community Board franchise and consent committee sent a letter supporting the Sixth Avenue/Upper Manhattan proposals.

MANHATTAN COMMUNITY BOARD #7

Communities Represented:
Upper West Side

Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA", "B"
Stations Affected:
59th Street/Eighth Avenue,
72nd Street/Central Park
West, 81st Street/Central
Park West, 86th Street
/Central Park West, 96th
Street/Central Park West,
103rd Street/Central Park
West, 110th Street/Eighth
Avenue

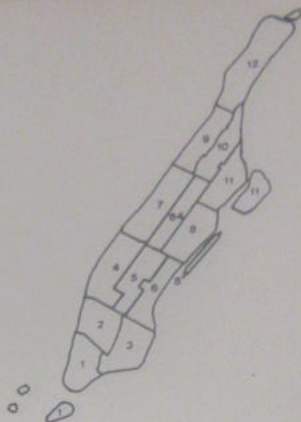


Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Dec 1, 1981 - Joint meeting for Manhattan Community Boards #7, 9, 10 & 12. Board #7 transportation chairperson stated that he supported the proposals, in particular operating the offpeak "A" local south of 59th Street/Eighth Avenue.
- Dec 12, 1981 - Community Board sent a letter supporting the Sixth Avenue/Upper Manhattan proposals.

MANHATTAN COMMUNITY BOARD #9
Communities Represented:
West Harlem

Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA", "B"
Stations Affected:
110th Street/Eighth Avenue,
116th Street/Eighth Avenue,
125th Street/St. Nicholas,
135th Street/St. Nicholas,
145th Street/St. Nicholas,
155th Street/St. Nicholas,
155th Street/Eighth Avenue

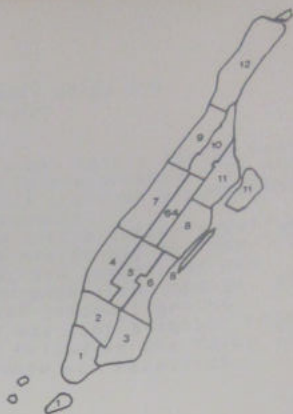


Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Dec 1, 1981 - Joint meeting for Manhattan Community Boards #7, 9, 10 & 12. Board #9 was not represented.
- Dec 10, 1981 - Meeting with community district manager to discuss the proposals. He suggested that a public hearing may be required before the Board could act on the proposals.
- Mar 3, 1982 - District manager was sent a letter detailing the proposals and requesting the Board's response to the proposals by March 12th, otherwise it would be assumed that the board had no comments (no response was received).

MANHATTAN COMMUNITY BOARD #10

Communities Represented:
Central Harlem



Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA", "B"

Stations Affected:
110th Street/Eighth Avenue,
116th Street/Eighth Avenue,
125th Street/St. Nicholas,
135th Street/St. Nicholas,
145th Street/St. Nicholas,
155th Street/St. Nicholas,
155th Street/Eighth Avenue

Chronology of Participation:

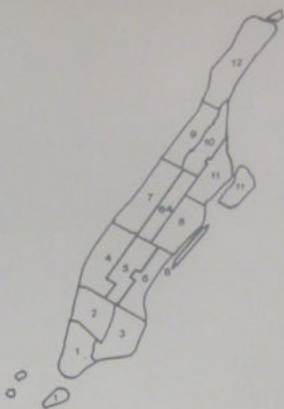
- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Dec 1, 1981 - Joint meeting for Manhattan Community Boards #7, 9, 10 & 12. Board #10 board members were not satisfied regarding the need for any service changes and whether special interest groups (e.g.: senior citizens) were considered. They requested additional information pertaining to system use by senior citizens.
- Dec 4, 1981 - In a telephone conversation, the transportation vice-chairperson was told that the specific information requested on December 1st was not available. He responded that there seemed to be little justification for removing a service to which people were accustomed, although he understood the reasons set forth in the proposal. He stated a preference to operate both "AA" and "B" service to 168th Street at half their normal headways.
- Jan 15, 1982 - Community Board was sent a letter describing the problems with a joint "AA"- "B" service with a demand table for each station in the community.

MANHATTAN COMMUNITY BOARD #10
(continued)

- Feb 17, 1982 - Community Board was sent a letter requesting their response to the proposals by March 5th, otherwise it would be assumed that the board had no comments.
- Mar 3, 1982 - Community Board sent a letter questioning the validity of the Study, the need for any service changes, the impacts of new construction and population change, and the affect on special interest groups.
- Mar 23, 1982 - Community Board was sent a letter responding to the concerns raised in the March 3rd letter (no response was received).

MANHATTAN COMMUNITY BOARD #12
Communities Represented:
Washington Heights, Inwood

Proposal:
Sixth Avenue/Upper Manhattan
Services Affected:
"A", "AA", "B"
Stations Affected:
155th Street/St. Nicholas,
163rd Street/St. Nicholas,
168th Street/Broadway,
175th Street/Ft. Washington,
181st Street/Ft. Washington,
190th Street/Ft. Washington,
Dyckman Street/Broadway,
207th Street/Broadway



Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Dec 1, 1981 - Joint meeting for Manhattan Community Boards #7, 9, 10 & 12. Board #10 was not represented.
- Jan 18, 1982 - Meeting of the Board's transportation committee to discuss the proposals.
- Mar 3, 1982 - Community Board sent a letter supporting the Sixth Avenue/Upper Manhattan proposals.

As shown on Figure ##, the following community boards were determined to be affected by this proposal:

Manhattan Community Boards #1, 3, 4, 5, 7, 9, 10 & 12.

An initial presentation was made prior to the development of preliminary proposals to the Manhattan Borough Board on October 30, 1979. The Manhattan Borough President sent a letter to the Manhattan Community Boards at the Authority's request on May 23, 1980, describing the objectives of the study and asking for their participation in the planning process.

After the preliminary proposals were developed, a joint meeting was held on November 23, 1981, to include Manhattan Community Boards #4 and 5, on November 30, 1981, to include Manhattan Community Boards #1 and 3, and on December 1, 1981, to include Manhattan Community Boards #7, 9, 10 and 12. The involvement of each individual Community Board in these meetings, as well as their subsequent involvement in the community participation process, is outlined in figures ## - ##.

In summary, of the nine community boards affected by the Sixth Avenue-Upper Manhattan proposals, six community boards responded favorably, one community board did not respond favorably and two community boards had no comment. Five of the boards that responded favorably did so only after the preliminary proposals were modified to operate the offpeak "A" local south of 59 Street, replacing the "AA" service. Manhattan Community Board #1 did not favor the proposal as it opposed eliminating "AA" service in Lower Manhattan.

Although it was not initially considered affected, Brooklyn* Community Board #11 (Bensonhurst) felt that its constituency would not benefit by this proposal. The board was concerned that extending the "B" to 168 Street will adversely affect service reliability on the West End Line.

2. Queens Boulevard-Astoria Proposals

The Queens Boulevard-Astoria proposals would alter the present "B", "D", "F", "GG", "N" and "RR" and add a new route "Y" service. A summary of these service changes follows:

- "B" - Replace the night shuttle to 57 Street/Sixth Avenue with the "F".
- "D" - Operate the "D" local on Sixth Avenue at nights (between 1AM and 5AM).
- "F" - Extend the hours of "F" express service in Queens until 1AM.
- Turn the "F" at 57 Street/Sixth Avenue at nights (between 1AM and 5AM)

- "GG" - Turn the "GG" at Queens Plaza evenings (9PM weeknights, 8PM Saturdays, 7PM Sundays).
- "N" - Operate the "N" as a Broadway Express, between Astoria and Coney Island at all time ("N" night shuttle on the Sea Beach Line is no longer required).
 - All "N" trains stop at 49 Street/Seventh Avenue.
 - Replace the "N" Whitehall Specials with the "V".
- "RR" - Operate the "RR" as a Broadway Local between 71-Continental Avenues and 95 Street/Fourth Avenue, at all times.
 - Extend the "RR" to 179 Street at all times, when the "F" turns at 57 Street/Sixth Avenue.
- "V" - Operate the "V" as a Broadway Local between Astoria and Whitehall Street during peak periods in the peak direction.

As shown in Figure 47, the following community boards were determined to be affected by this proposal:

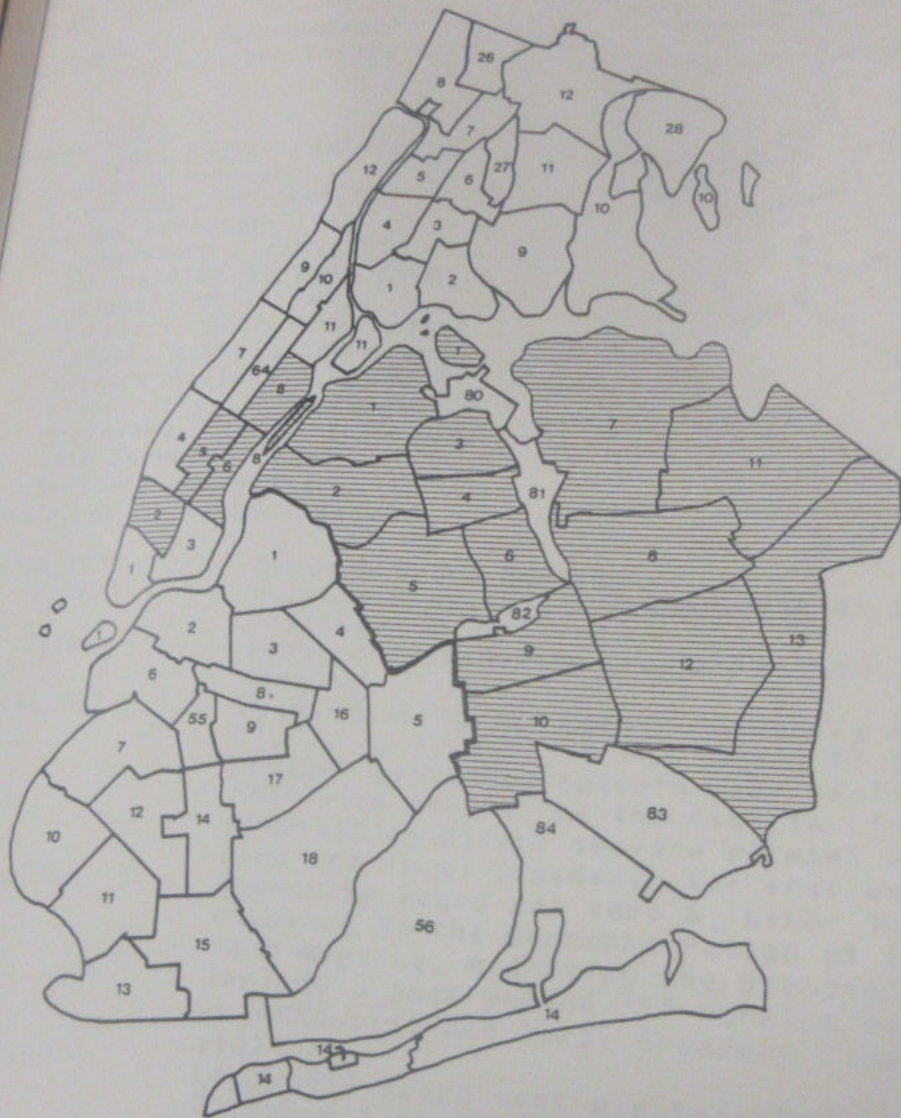
Queens Community Boards #1, 2, 3, 4, 5, 6, 7,
8, 9, 10, 11, 12 & 13.

Manhattan Community Boards #2, 5, 6 and 8.

Initial presentations were made prior to the development of preliminary proposals to the Queens Borough Board (September 18, 1979) and Manhattan Borough Board (October 30, 1979), as well as to Queens Borough President's Transportation Committee (March 19, 1980). The Manhattan Borough President sent a letter to the Manhattan Community Boards at the Authority's request on May 23, 1980, describing the objectives of the Study and asking for their participation in the planning process.

After the preliminary proposals were developed, subsequent meetings were held with the Queens Borough President's Transportation Committee on December 17, 1980 and March 19, 1983). A joint meeting was held on June 18, 1981, to include Queens Community Boards #5, 8, 9, 10, 12 and 13, on June 23, 1981, to include Queens Community Boards #1, 2, 3, 4, 6, 7 and 11, on November 23, 1981, to include Manhattan Community Board #5, 6, and 8, and on November 30, 1981, to include Manhattan Community Board #2. The involvement of each individual community board in these meetings, as well as their subsequent involvement in the community participation process, is outlined in the chronologies that follow this page.

In summary, of the 16 community boards affected by the Queens Boulevard-Astoria proposals, 11 community boards



Community Boards Affected By The Queens Boulevard-Astoria Proposal



FIGURE

47



New York City
Transit
Authority

QUEENS COMMUNITY BOARD #1

Communities Represented:
Astoria, Long Island City

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR", "V"
Stations Affected:
Queensboro Plaza, 39th
Avenue/31st Street, 36th
Avenue/31st Street,
Broadway, 30th Avenue/31st
Street, Astoria Boulevard,
Ditmars Boulevard, Queens
Plaza, 36th Street/Northern
Boulevard, Steinway Street,
46th Street/Broadway,
Northern Boulevard



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. Board #1 district manager expressed concern over replacing the "RR" with the "N" on the Astoria Line, eliminating direct service between Astoria Line and local Broadway Line stations.
- Dec 12, 1981 - Community Board was sent a letter in response to the concerns raised at the June 23rd meeting, modifying the proposals to include a peak period "V" service between Astoria Line and local Broadway Line stations.
- Jan 13, 1982 - Community board sent minutes from its December 17th board meeting at which opposition to the proposals was expressed; the minutes did not refer to the December 12th letter.
- Jan 20, 1982 - Community board was sent a letter requesting the Board's response to the modified proposals discussed in the December 12th letter.
- Feb 10, 1982 - Meeting with the Board's transportation committee. No objection was expressed to the modified proposals, but study staff was asked to attend a public board meeting on March 18th.

QUEENS COMMUNITY BOARD #1
(continued)

- Mar 18, 1982 - Meeting with the Community Board. Following a public presentation, the Board voted to support the proposals.
- Mar 23, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #2

Communities Represented:
Woodside, Sunnyside

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
Northern Boulevard, 65th
Street/Broadway



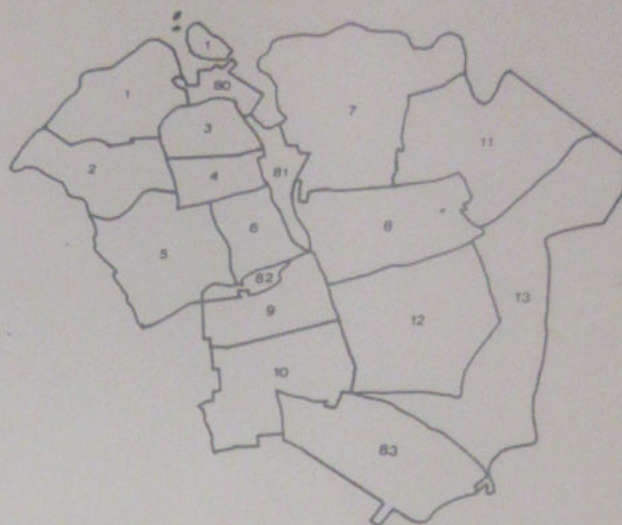
Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. Board #2 was not represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #3

Communities Represented:
Jackson Heights, East
Elmhurst

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
Roosevelt Avenue
(74th Street/Roosevelt,
82nd Street/Roosevelt,
90th Street/Roosevelt,
Junction Boulevard,
103rd Street/Roosevelt,
111th Street/Roosevelt)

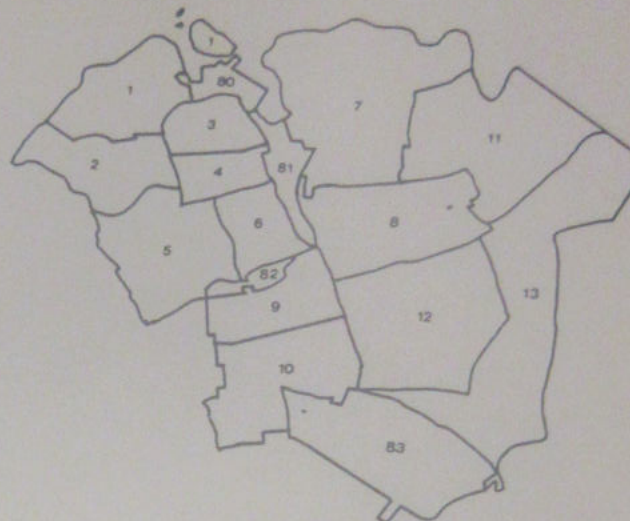


Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. Board #3 was represented.
- Jan 19, 1982 - Meeting with the Board's transportation committee to discuss the proposals.
- Mar 4, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #4
Communities Represented:
Elmhurst, Corona

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
Roosevelt Avenue, Elmhurst
Avenue, Grand Avenue,
Woodhaven Boulevard



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. The Board's transportation chairperson expressed a desire to see either the Broadway Line service extended to the Queens Boulevard Line evenings and weekends.
- Feb 9, 1982 - Meeting with the Board's transportation committee to discuss the proposals. Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #5
Communities Represented:
Ridgewood, Glendale

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
Woodhaven Boulevard, 63rd
Drive



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12, & 13. Board #5 was represented.
- Feb 9, 1982 - In a telephone conversation, the Board's transportation committee chairperson stated that the Board was not affected by the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #6
Communities Represented:
Forest Hills, Rego Park

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
Woodhaven Boulevard, 63rd
Drive, 67th Avenue/Queens
Boulevard, 71st Avenue
-Continental Avenue (Forest
Hills), 75th Avenue/Queens
Boulevard, Union Turnpike



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- May 26, 1981 - Meeting with the Community Board to discuss the proposals.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. Board #6 was represented.
- Feb 26, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #7

Communities Represented:
Flushing, Whitestone,
College Point

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
(Main Street-Flushing)



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. Board #2 was not respresented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Nov 19, 1981 - Meeting with the Board's transportation committee. Committee expressed concern over the elimination of night "F" service in Queens, stating that more Flushing Line riders would be exposed to crime by transferring at 42nd Street/Sixth Avenue vs. Roosevelt Avenue.
- Dec 21, 1981 - Board transporation chairperson was sent a letter detailing relevant crime statistics to allay concerns about a late night transfer at 42nd Street/Sixth Avenue.
- Jan 11, 1982 - In a telephone conversation, the Board's transportation chairperson was skeptical about the statistics provided in the December 21st letter and requested more discussion.

QUEENS COMMUNITY BOARD #7
(continued)

Feb 5, 1982

- In a telephone conversation, the Board's transportation chairperson was informed that the addition of two extra hours of evening "F" express service in Queens, as proposed, outweighed the curtailment of "F" service in Queens between 1AM and 5AM. Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.

Mar 14, 1983

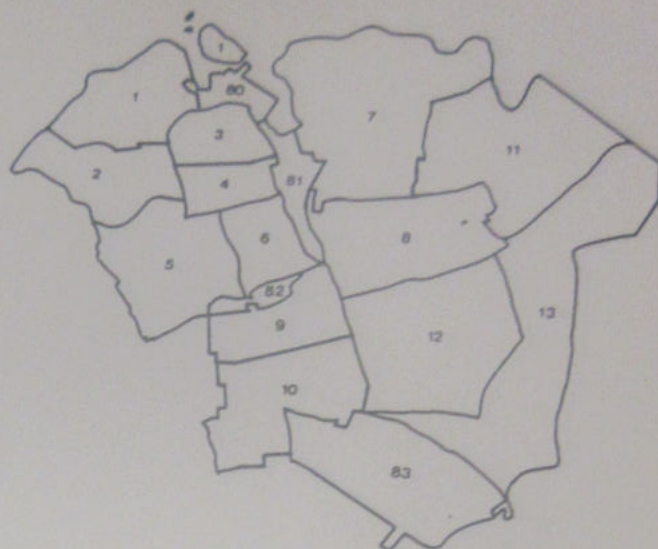
- Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #8

Communities Represented:
Kew Gardens, Fresh Meadows

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "RR"

Stations Affected:
Union Turnpike, Van Wyck
Boulevard, Sutphin
Boulevard, Parsons
Boulevard, 169th Street
/Hillside Avenue, 179th
Street/Hillside Avenue

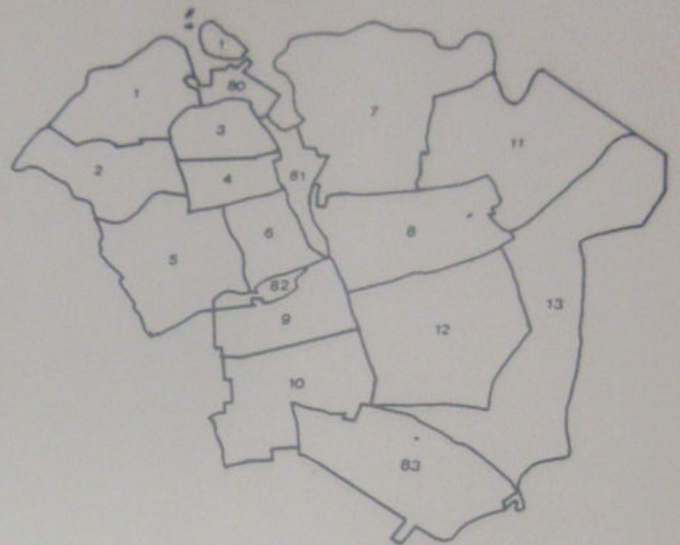


Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12, & 13. Board #8 was not represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #9
 Communities Represented:
 Woodhaven, Richmond Hill

Proposal:
 Queens Boulevard-Astoria
 Services Affected:
 "F", "RR"
 Stations Affected:
 Union Turnpike



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Nov 5, 1980 - Community Board transportation chairperson sent a letter requesting skip-stop operation on the Queens Boulevard Line.
- Dec 12, 1980 - Community Board transportation chairperson was sent a response to his November 5th letter stating that skip-stop would not be as effective a method of addressing Queens Boulevard Line demand as the present express service.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12, & 13. Board #9 was not represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #10
 Communities Represented:
 Ozone Park, South Ozone
 Park, Howard Beach

proposal:
 Queens Boulevard-Astoria
 Services Affected:
 "F", "RR"
 Stations Affected:
 Union Turnpike, Sutphin
 Boulevard



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12, & 13. Board #10 was represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #11
Communities Represented:
Bayside, Little Neck

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "GG", "N", "RR"
Stations Affected:
169th Street/Hillside
Avenue, 179th Street
/Hillside Avenue (Main
Street-Flushing)



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 23, 1981 - Joint meeting for Queens Community Boards #1, 2, 3, 4, 6, 7, & 11. The Board's transportation chairperson expressed concern over replacing the "RR" with the "N" on the Astoria Line, creating extra transfers for riders between the Flushing Line and local Broadway Line stations.
- Mar 1, 1982 - Community Board was sent a letter in response to the concerns raised at the June 23rd meeting, modifying the proposals to include a peak period "V" service between Astoria Line and local Broadway Line stations.
- Feb 26, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #12
 Communities Represented:
 Jamaica, Jamaica Estates,
 Hollis, St. Albans

Proposal:
 Queens Boulevard-Astoria
 Services Affected:
 "F", "RR"
 Stations Affected:
 xxxxxxxxxxxxxx



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12, & 13. Board #12 was not represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #13
Communities Represented:
Eastern Queens

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "RR"
Stations Affected:
Van Wyck Boulevard, Sutphin
Boulevard, Parsons
Boulevard, 169th Street/
Hillside Avenue, 179th
Street/Hillside Avenue



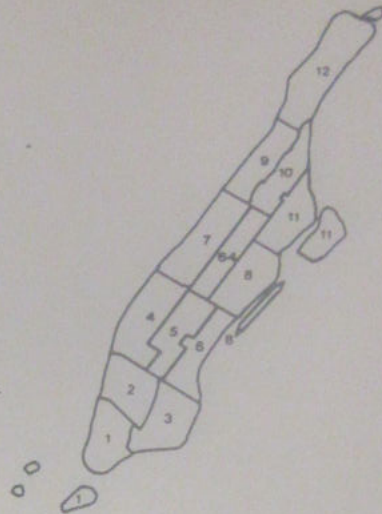
Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12, & 13. Board #13 was represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Feb 24, 1982 - In a telephone conversation, the Board's transportation chairperson stated that the proposals would probably be supported.
- Apr 1, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

MANHATTAN COMMUNITY BOARD #2

Communities Represented:
West Village, Soho

Proposal:
Queens Boulevard-Astoria
Services Affected:
"N", "RR", "V"
Stations Affected:
Canal Street,
Prince Street,
8th Street/Broadway,
14th Street/Broadway



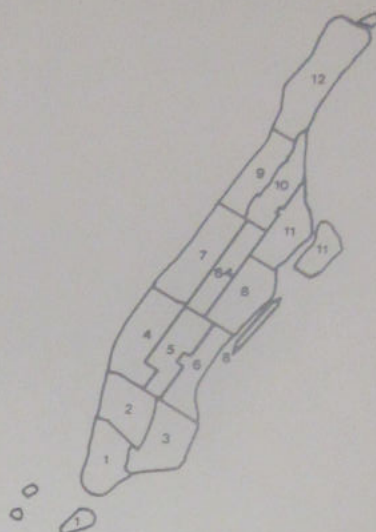
Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 30, 1981 - Joint meeting for Manhattan Community Boards #1, 2 & 3. Board #2 was represented.
- Mar 23, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.

MANHATTAN COMMUNITY BOARD #5

Communities Represented:
Midtown Manhattan

Proposal:
Queens Boulevard-Astoria
Services Affected:
"N", "RR", "V"
Stations Affected:
14th Street/Broadway,
28th Street/Broadway,
34th Street/Broadway,
42nd Street/Broadway,
49th Street/Seventh Avenue,
57th Street/Seventh Avenue,
Fifth Avenue/60th Street,
Lexington Avenue/60th Street

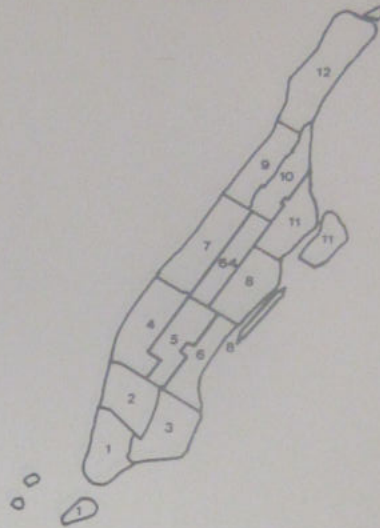


Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 23, 1981 - Joint meeting for Manhattan Community Boards #4, 5, 6 & 8. Board #5 franchise and consent chairperson stated that a full-time link between the Queens Boulevard and Broadway Lines was important.
- Dec 10, 1981 - Meeting with the Board to distribute materials pertaining to the proposals.
- Jan 6, 1982 - Meeting with the Board's franchise and consent committee to discuss the proposals.
- Jan 15, 1982 - Community Board was sent the written materials that were requested.
- Apr 9, 1982 - Community Board franchise and consent committee sent a letter supporting the Sixth Avenue/Upper Manhattan proposals.

MANHATTAN COMMUNITY BOARD #6
Communities Represented:
East Midtown

Proposal:
Queens Boulevard-Astoria
Services Affected:
"F", "N", "RR", "V"
Stations Affected:
Lexington Avenue/60th
Street, Lexington
Avenue/53rd Street



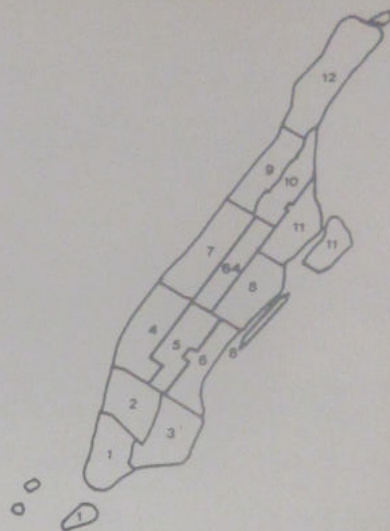
Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 23, 1981 - Joint meeting for Manhattan Community Boards #4, 5, 6 & 8. Board #6 was not represented.
- Jan 14, 1982 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Mar 15, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.

MANHATTAN COMMUNITY BOARD #8

Communities Represented:
Upper East Side

Proposal:
Queens Boulevard-Astoria
Services Affected:
"N", "RR", "V"
Stations Affected:
Lexington Avenue/60th
Street, Lexington
Avenue/53rd Street



Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 23, 1981 - Joint meeting for Manhattan Community Boards #4, 5, 6 & 8. The Board's transportation chairperson stated that the proposals would increase offpeak service in the community.
- Dec 7, 1981 - Meeting with transportation committee to discuss the proposals.
- Jan 26, 1982 - Community Board sent a letter supporting the Queens Boulevard-Astoria proposals.

responded favorably and five community boards had no comment. Queens Community Board #1 supported the proposal only after the "F" service was added to the preliminary proposals. The favorable responses from Queens Community Boards #7 and 11 were predicated on extending express "F" service to 179 Street until JAN.

3. Eastern Division Proposals

The Eastern Division proposals would alter the present "J", "LL" and "M" services and add a new "K" service. A summary of these service changes follows:

- "J" - Extended peak "J" express service to operate between Marcy Avenue and Eastern Parkway.
 - Replace off-peak "J" service with the "K".
- "K" - Operate the "K" local between 57 Street/Sixth Avenue and:
 - Rockaway Parkway (Canarsie) during peak periods.
 - Queens Blvd-Jamaica Avenue, all other times (except nights).
- "LL" - Originate or terminate some peak period trips at Atlantic Avenue.
- "M" - Extend the "M" to Broad Street during evenings and weekends (except nights).

As shown in Figure 48, the following community boards were determined to be affected by this proposal:

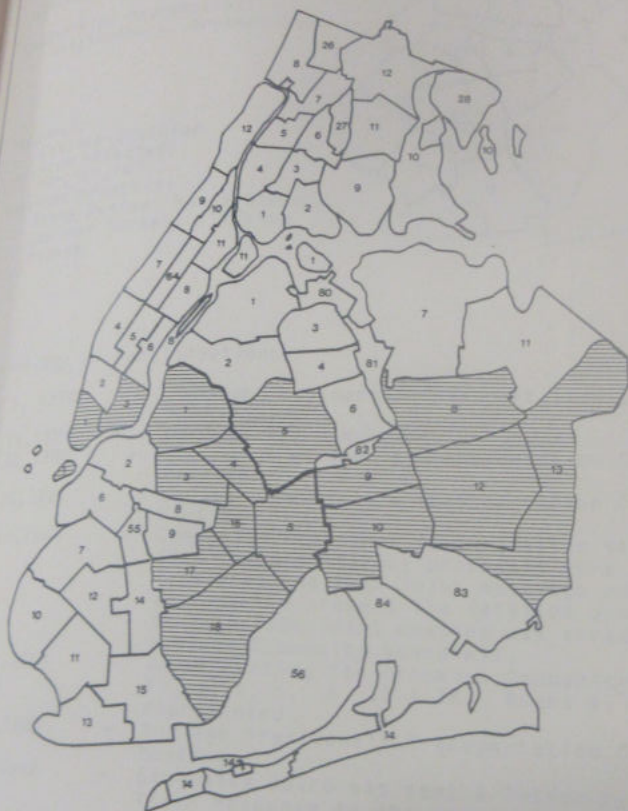
Brooklyn Boards #1, 3, 4, 5, 16, 17 & 18

Queens Boards #5, 8, 9, 10, 12 & 13

Manhattan Boards #1 & 3

Presentations were made before preliminary proposals were developed to the Queens Borough Board (September 18, 1979), Brooklyn Borough Board (October 16, 1979) and Manhattan Borough Board (October 30, 1979), as well as to the Borough President's Transportation Committee of Brooklyn (October 3, 1979, March 10, 1980) and Queens (March 19, 1980). The Manhattan Borough President sent a letter to the Manhattan Community Boards at the Authority's request on May 23, 1980, describing the objectives of the study and asking for their participation in the planning process.

After the preliminary proposals were developed, subsequent meetings were held with the Borough President's Transportation



Community Boards Affected By The Eastern Division Proposal



FIGURE

48



New York City
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BROOKLYN COMMUNITY BOARD #1
Communities Represented:
Williamsburg, Greenpoint

Proposal:
Eastern Division
Services Affected:
"J", "K", "M"
Stations Affected:
Marcy Avenue, Hewes Street,
Lorimer Street, Flushing
Avenue



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #1).
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #1 was not represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Feb 2, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).

BROOKLYN COMMUNITY BOARD #3

Communities Represented:
Bedford Stuyvesant

Proposal:
Eastern Division
Services Affected:
"J", "K", "M"
Stations Affected:
Flushing Avenue, Myrtle
Avenue, Kosciusko Street,
Gates Avenue



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #3).
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #3 was represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments.
- Mar 3, 1982 - Community Board sent a letter stating that it had no objections to the proposals.

BROOKLYN COMMUNITY BOARD #4
Communities Represented:
Bushwick

Proposal:
Eastern Division
Services Affected:
"J", "LL", "K", "M"
Stations Affected:
Flushing Avenue, Myrtle
Avenue, Kosciusko Street,
Gates Avenue, Central
Avenue, Knickerbocker
Avenue, Wyckoff Avenue.



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #4).
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #4 was represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).

BROOKLYN COMMUNITY BOARD #5

Communities Represented:
East New York



Proposal: Eastern Division

Services Affected:
"J", "LL", "K"

Stations Affected:

Eastern Parkway, Alabama Avenue, Van Siclen Avenue, Cleveland Street, Norwood Avenue, Cresent Street, Cypress Hills, Elderts Lane, Atlantic Avenue, Sutter Avenue, Livonia Avenue, New Lots Avenue

Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #5).
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #5 was not represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).

BROOKLYN COMMUNITY BOARD #16
Communities Represented:
Brownsville

Proposal:
Eastern Division
Services Affected:
"J", "LL", "K"
Stations Affected:
Halsey Street ("J"),
Chauncey Street, Eastern
Parkway, Atlantic Avenue,
Sutter Avenue, Livonia
Avenue, New Lots Avenue



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #16).
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #16 was not represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).

BROOKLYN COMMUNITY BOARD #17
Communities Represented:
East Flatbush

Proposal:
Eastern Division
Services Affected:
"LL", "K"
Stations Affected:
Rockway Parkway



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #17.
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #17 was not represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).

BROOKLYN COMMUNITY BOARD #18
Communities Represented:
Canarsie

Proposal:
Eastern Division
Services Affected:
"LL", "K"
Stations Affected:
Rockaway Parkway



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Meeting of the Borough President's Transportation Committee Meeting. Board #18 suggested reviving the previous "K" service, originating at Rockaway Parkway.
- Mar 12, 1980 - In a telephone conversation, the transportation chairperson from Board #18 requested a map showing possible "K" alignments.
- Mar 25, 1980 - A letter was sent to Board #18 with the map requested on March 12th.
- Mar 31, 1980 - In a telephone conversation, the transportation chairperson requested revisions to the map sent on March 25th.
- Apr 14, 1980 - Sent revised map requested by Board #18 on March 31st.
- May 7, 1980 - Board sent letter requesting a meeting with the Community Board's transportation committee.
- May 29, 1980 - Meeting with the Board's transportation committee. Committee endorsed a "K" service in addition to the "LL" to Rockaway Parkway, but rejected any peak service reductions in "LL" service to accommodate the "K", or the addition of more feeder bus service to Rockaway Parkway.
- Jun 10, 1980 - Meeting with the transportation chairperson at Rockaway Parkway Station to observe peak period "LL" passenger volumes first-hand.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.

BROOKLYN COMMUNITY BOARD #18
(continued)

- Apr 17, 1981 - Community Board was sent a letter stating that the preliminary proposals were developed and that joint meetings would be arranged to present the detailed proposals (a June 15th joint meeting was arranged to include Community Board #18).
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #1, 3, 4, 5, 16, 17 & 18. Board #18 recommended that the "K" operate express along Broadway-Brooklyn and Sixth Avenue.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Jun 21, 1982 - Meeting with the Board's transportation committee, where concern was expressed over turning 2 to 3 "LL" trains at Atlantic Avenue during peak periods.
- Jun 24, 1982 - In a telephone conversation, the transportation chairperson linked support of the "K" with removal of a garbage dump adjacent to Rockaway Parkway Station. Follow-up was conducted through TA External Affairs.
- Jun 28, 1982 - At a meeting with the Board's transportation committee, the committee suggested diverting capital funds from the Canarsie Yard project to remove the dump and construct a third track and platform at Rockaway Parkway. They requested a fact sheet describing the operational aspects of "LL" and "K" service at Rockaway Parkway.
- Jul 9, 1982 - A letter was sent with a fact sheet as requested on June 28th.
- Jul 14, 1982 - At a meeting with the Board's transportation committee, following a presentation of "K" benefits to Canarsie, the committee voted 4-to-2 to oppose the "K" because 2 to 3 peak "LL" trains would be turned at Atlantic Avenue. The Board subsequently voted 15-to-0 (2 abstentions) to oppose the "K".

QUEENS COMMUNITY BOARD #5
Communities Represented:
Ridgewood, Glendale

Proposal:
Eastern Division
Services Affected:
"LL", "M"
Stations Affected:
Rockway Parkway



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12 & 13. Board #15 stated that the "M" should operate express between Myrtle and Marcy Avenues.
- Dec 9, 1981 - At the Board's request, the proposal was presented at a Board Meeting. The consensus was that the proposal would not benefit the community and they reiterated their support for the "M" express as a means of speeding "M" service to Manhattan.
- Dec 11, 1981 - In a telephone conversation, a board member expressed support for the "M" express. An invitation was extended to the Board for a field review of the "J" express and "M" running times.
- Jan 6, 1982 - A letter was sent requesting a response to the December 11th invitation for a field review by January 22nd.
- Feb 8, 1982 - In a telephone conversation, a board member agreed to attend a field review on February 18th.
- Feb 17, 1982 - In a telephone conversation, the community district manager suggested a meeting with the Board's mass transit committee on March 2nd to discuss the proposals with a small group.

QUEENS COMMUNITY BOARD #5
(continued)

- Feb 18, 1982 - A field review of "J" express and "M" running times indicated that an "M" express would only save about one-minute, twenty-seconds. No board members attended.
- Mar 2, 1982 - Meeting with the mass transit committee. The committee agreed with the proposals, but felt that "M" service needed improvement.
- Mar 4, 1982 - In a telephone conversation, the district manager suggest a presentation to the transportation committee prior to the next board meeting.
- Mar 10, 1982 - At a meeting with the Board's transportation committee, following a presentation of the proposals, the committee voted unanimously to support the proposals. The Board subsequently unanimously supported the proposals.
- Mar 24, 1982 - Community Board sent a letter supporting the Eastern Division proposals.
- Mar 14, 1983 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #8
 Communities Represented:
 Kew Gardens, Fresh Meadows

Proposal:
 Eastern Division
 Services Affected:
 "J", "K"
 Stations Affected:
 Queens Boulevard



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12 & 13. Board #8 was represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1981 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #9
Communities Represented:
Woodhaven, Richmond Hill

Proposal:
Eastern Division
Services Affected:
"J", "K"
Stations Affected:
Elderts Lane, Forest
Parkway, Woodhaven
Boulevard, 102nd Street,
111th Street, 121st Street,
Metropolitan Avenue ("J")



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12 & 13. Board #9 was not represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1981 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #10
 Communities Represented:
 Ozone Park, South Ozone
 Park, Howard Beach

Proposal:
 Eastern Division
 Services Affected:
 "J", "K"
 Stations Affected:
 Elderts Lane, Forest
 Parkway, Woodhaven
 Boulevard, 102nd Street,
 111th Street, 121st Street,
 Metropolitan Avenue ("J")



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12 & 13. Board #10 was represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1981 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #12
 Communities Represented:
 Jamaica, Jamaica Estates,
 Hollis, St. Albans

Proposal:
 Eastern Division
 Services Affected:
 "J", "K"
 Stations Affected:
 Queens Boulevard



Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12 & 13. Board #12 was not represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments (no response was received).
- Mar 14, 1981 - Borough President's Transportation Committee Meeting.

QUEENS COMMUNITY BOARD #13
Communities Represented:
Eastern Queens

Proposal:
Eastern Division
Services Affected:
"J", "K"
Stations Affected:
Queens Boulevard

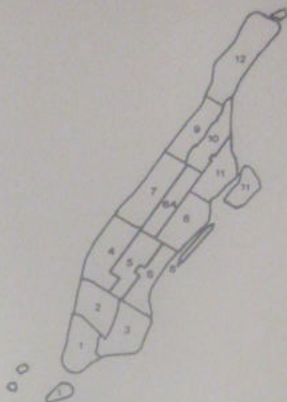


Chronology of Participation:

- Sep 18, 1979 - Borough Board Meeting.
- Mar 19, 1980 - Borough President's Transportation Committee Meeting.
- Dec 17, 1980 - Borough President's Transportation Committee Meeting.
- Jun 18, 1981 - Joint meeting for Queens Community Boards #5, 8, 9, 10, 12 & 13. Board #13 was represented.
- Oct 14, 1981 - Community Board was sent written material detailing the proposals and requesting their opinions.
- Feb 8, 1982 - Community Board was sent a letter requesting their response to the proposals by February 26th, otherwise it would be assumed that the board had no comments.
- Feb 24, 1982 - In a telephone conversation, the transportation chairperson stated the proposals would probably be supported.
- Apr 1, 1982 - Community Board sent a letter supporting the Eastern Division proposals.
- Mar 14, 1981 - Borough President's Transportation Committee Meeting.

MANHATTAN COMMUNITY BOARD #1
Communities Represented:
Lower Manhattan

Proposal:
Eastern Division
Services Affected:
"J", "M"
Stations Affected:
Broad Street, Fulton
Street, Chambers Street,
Canal Street

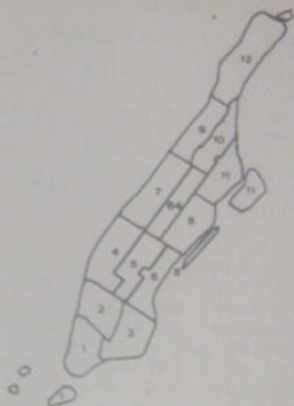


Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 30, 1981 - Joint meeting for Manhattan Community Boards #1, 2 & 3. Board #1 was represented.
- Feb 2, 1982 - Meeting with the Board's transportation committee. The committee stated that their community would not be affected by the Eastern Division proposals.

MANHATTAN COMMUNITY BOARD #3
Communities Represented:
Lower East Side

Proposal:
Eastern Division
Services Affected:
"J", "M"
Stations Affected:
Canal Street, Essex Street



Chronology of Participation:

- Oct 30, 1979 - Borough Board Meeting.
- May 23, 1980 - At our request, the Borough President sent a letter to the Board describing the objectives of the Study and requesting their participation.
- Nov 30, 1981 - Joint meeting for Manhattan Community Boards #1, 2 & 3. Board #3 was represented.
- Dec 22, 1981 - Community Board sent a letter supporting the Eastern Division proposals.

Committees of Queens (December 17, 1980, March 19, 1983) and Brooklyn (April 15, 1981, July 29, 1981). Joint meetings were held on June 15, 1981, to include Brooklyn Community Boards #1, 3, 4, 5, 16, 17, & 18, on June 18, 1981, to include Queens Community Boards #5, 8, 9, 10, 12 & 13, and on November 30, 1981, to include Manhattan Community Boards #1 & 3 (and Board #2, as well, for their information). The involvement of each individual community board in these meetings, as well as their subsequent involvement in the process of evaluating the preliminary proposals, is outlined in chronologies that follow this page.

In summary, of the 15 community boards affected by the Eastern Division proposals, four community boards responded favorably, one community board did not respond favorably, and ten community boards had no comment. Brooklyn Community Board #18 (Canarsie) did not favor the proposal as the Board wanted the present "LL" headways maintained in addition to the new "K" service to Canarsie. As proposed, one-third to one-half of the peak service on the Canarsie Line (Atlantic Avenue-Rockaway Parkway) will be "K" trains, resulting in less peak "LL" service than at present south of Atlantic Avenue.

4. Southern Division Proposals

The Southern Division proposals would replace the present "RR" Chambers Street Specials with a new "T" service. A summary of the "T" service follows:

"T" - Operates local between Chambers Street and Bay Parkway/85 Street during peak periods in the peak direction.

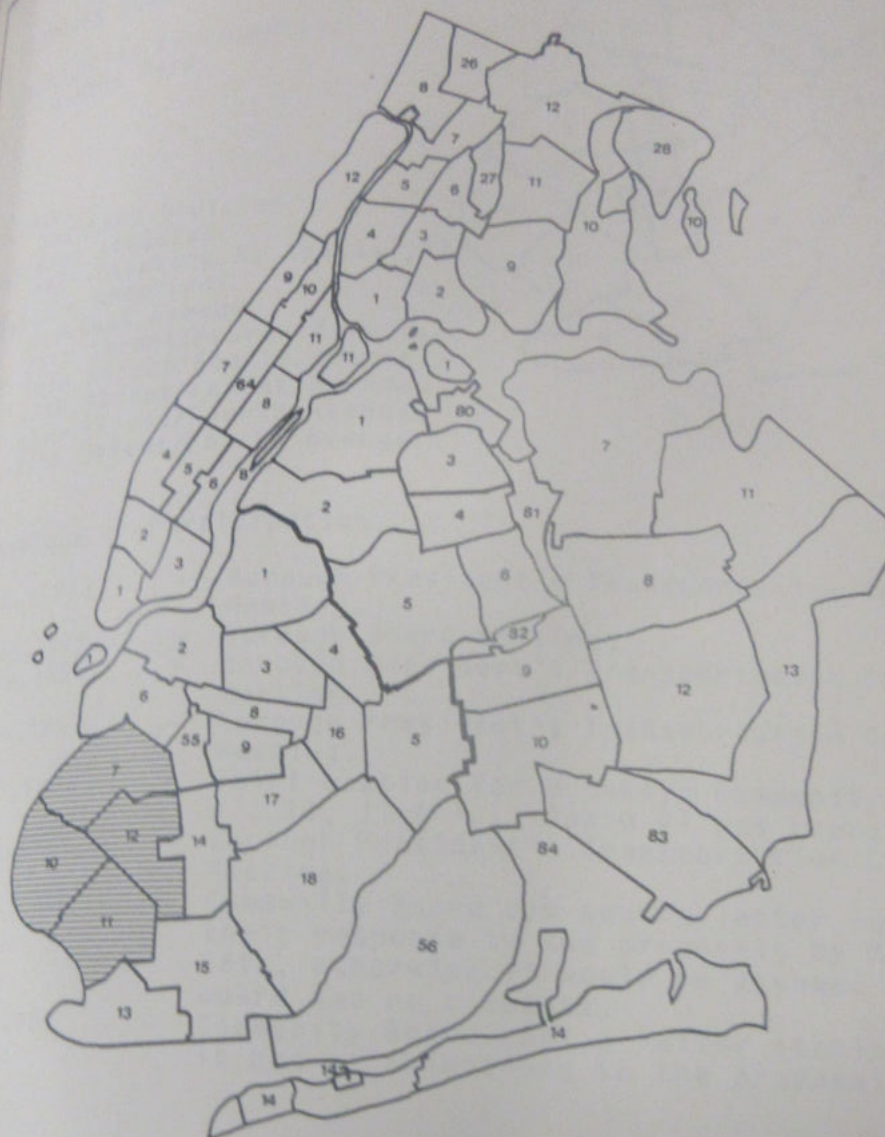
As shown in Figure 49, the following community boards were determined to be affected by the proposal:

Brooklyn Community Boards #7, 10, 11, and 12

Initial presentations were made prior to the development of preliminary proposals to the Brooklyn Borough Board (October 16, 1979) and to the Brooklyn Borough President's Transportation Committee (October 3, 1979 and March 10, 1980).

After the preliminary proposals were developed, subsequent meetings were held with the Brooklyn Borough President's Transportation Committee on April 15, 1981 and July 29, 1981. Joint meetings were held on June 22, 1981, and April 27, 1982, to include Brooklyn Community Boards #10, 11 and 12. The involvement of the Community Boards in these meetings, as well as their subsequent involvement in the community participation process, is outlined in chronologies that follow this page.

In summary, of three community boards affected by the Southern Division proposals, two community boards responded favorably and one community board did not respond favorably. Brooklyn Community Board #11 (Bensonhurst), which favored the



Community Boards
Affected By The
Southern Division
Proposal



FIGURE
49



New York City
Transit
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BROOKLYN COMMUNITY BOARD #7 Communities Represented: Sunset Park



Proposal:
Southern Division
Services Affected:
"RR"-Chambers St Special, "T"
Stations Affected:
Prospect Avenue,
25th Street/Fourth Avenue,
36th Street/Fourth Avenue,
45th Street/Fourth Avenue,
53rd Street/Fourth Avenue,
59th Street/Fourth Avenue

Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12. Board #7 was represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Mar 19, 1982 - Community Board was sent a letter requesting their response to the proposals by March 26th, otherwise it would be assumed that the board had no comments.
- Mar 3, 1982 - Community Board sent a letter stating that it had no objections to the proposals.

BROOKLYN COMMUNITY BOARD #10 Communities Represented: Bay Ridge

Proposal:
Southern Division
Services Affected:
"RR"-Chambers St Special, "T"
Stations Affected:
Bay Ridge Avenue,
77th Street/Fourth Avenue,
86th Street/Fourth Avenue,
95th Street/Fourth Avenue,
62nd Street/New Utrecht



Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12. Board #10 was not represented.
- Jun 24, 1981 - Community Board sent a letter to President Simpson protesting the proposed substitution of "RR" Chambers Street Specials with the "T".
- Jul 13, 1981 - Community Board was sent a letter informing the Board that the "T" was a preliminary proposal. The Board was asked to contact the Study staff to discuss their concerns as they did not attend the June 22nd meeting.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Jan 25, 1982 - Community Board was sent a letter explaining the proposals and requesting their response.
- Feb 1, 1982 - Meeting with the Board's executive committee.
- Feb 2, 1982 - Community Board sent a letter objecting to the proposals.
- Feb 24, 1982 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12.
- Apr 27, 1982 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12.
- May 10, 1982 - Community Board sent a letter to Chairman Ravitch objecting to the proposals.

BROOKLYN COMMUNITY BOARD #10
(continued)

May 26, 1982

- Community Board was sent a letter by Chairman Ravitch informing the Board that the "T" was a preliminary proposal. The Board was asked to work with the Authority through the Borough President's to resolve their differences (no response was received).

BROOKLYN COMMUNITY BOARD #11 Communities Represented: Bensonhurst



Proposal:
Southern Division
Services Affected:
"RR"-Chambers St Special, "T"
Stations Affected:
62nd Street/New Utrecht,
71st Street/New Utrecht,
79th Street/New Utrecht,
18th Avenue/New Utrecht,
20th Avenue/86th Street,
Bay Parkway/86th Street

Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Apr 22, 1981 - In a telephone conversation, a board member suggested some alternative routings for the "B", "N", and "RR".
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12. Board #11 transportation committee chairperson recommended operating the "T" express along the West End Line originating at Coney Island.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Feb 24, 1982 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12. Board #11 board member suggested that the "B" should not be extended to 168th Street offpeak as criminals from Upper Manhattan will be less likely to come to Brooklyn if their ride involves a transfer.
- Mar 29, 1982 - Community Board sent a letter supporting of the "B" if it originates at Coney Island. but opposing the "B" extension to 168th Street.
- Mar 30, 1982 - Meeting with community district manager to discuss the concerns expressed in the March 29th letter.
- Apr 27, 1982 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12.

BROOKLYN COMMUNITY BOARD #12
Communities Represented:
Sunset Park



Proposals:
Southern Division
Services Affected:
"RR"-Chambers St Special, "T"
Stations Affected:
Nineth Avenue/39th Street,
Fort Hamilton Parkway,
50th Street/New Utrecht,
55th Street/New Utrecht,
62nd Avenue/New Utrecht,

Chronology of Participation:

- Oct 3, 1979 - Borough President's Transportation Committee Meeting.
- Oct 16, 1979 - Borough Board Meeting.
- Mar 10, 1980 - Borough President's Transportation Committee Meeting.
- Apr 15, 1981 - Borough President's Transportation Committee Meeting.
- Jun 15, 1981 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12. Board #7 was represented.
- Jul 29, 1981 - Borough President's Transportation Committee Meeting.
- Jan 20, 1982 - Community Board was sent a letter requesting their response to the proposals.
- Feb 1, 1982 - Community Board sent a letter stating qualified support for the proposals, pending the resolution of specific service related issues.
- Feb 24, 1982 - Joint meeting for Brooklyn Community Boards #7, 10, 11 & 12.

proposals, requested that two alternative "T" operations be investigated---the first alternative, a "T" express along the West End Line, would not have provided service to the busiest stations on the "T" route; the second entailed extending the "T" to Coney Island, a proposition which RTD judged not feasible as it would create peak congestion at Coney Island (Brooklyn Board #11 also felt affected by the projected changes in "B" service as previously noted). Brooklyn Community Board #10 (Bay Ridge) did not favor the proposals as it opposed eliminating "RR" Chambers Street Specials ("RJ"). As proposed, peak "RR" will be increased to offset the loss of the specials at Bay Ridge.

Summary of Community Participation

A summary of the Community Board response to the RTSSS proposals is shown in Figure 50. The expanded community participation process---involving the borough and community boards in addition to the MTA/PCAC---provided a broader base for feedback concerning the study and simplified the MTA/PCAC review. Further, the expanded process established a working relationship with the community and borough boards that has benefitted other planning efforts.

PROPOSAL	BROOKLYN																		MANHATTAN												QUEENS															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	13			
SIXTH AV /UPPER MHTN																			●																											
QUEENS BLVD -ASTORIA																																														
EASTERN DIV	○																		○																											
SOUTHERN DIV																																														

●

○

SUPPORTED
NOT SUPPORTED
NO RESPONSE
NOT AFFECTED

- ☒ SUPPORTED
- ☐ NOT SUPPORTED
- ☐ NO RESPONSE
- ☐ NOT AFFECTED



Community Board Response

V
STATION ACCESS ANALYSIS

The New York City rapid transit system operates 24-hours a day, everyday, and with passenger access to all stations at all times.* Access to the station platforms are regulated by 521 fare control areas that are staffed at all times, 234 part-time fare control areas, and 201 unattended high-turnstiles. Entrances to control areas throughout the system are provided from both sidewalk and off-street locations.

The RTSSS data base, in addition to describing passenger travel patterns within the rapid transit system, also described passenger travel patterns before and after using the system. This information provides a basis for analysis of the station access patterns of the riding public. The station access analysis focused on methods for using this information to identify potential changes in fare control area operating hours.

Station Access Analysis Methodology

The RTSSS data base aggregates ridership data over 435 stations, systemwide.** The distance between station platforms ranges from 411 feet (between Franklin Avenue and Dean Street on the Franklin Shuttle Line) to 3.5 miles (between Howard Beach and Broad Channel on the Rockaway Line); average station spacing systemwide is approximately a half-mile.

* There is passenger access to all stations at all times. However, Dyre Avenue Line stations (Morris Park to Dyre Avenue) are not staffed after midnight when the #5 Shuttle operates; fare collection is accomplished on board the train. Further, access is not provided to the outbound platform (except for exiting passengers) at some outlying stations with extremely low passenger volumes and adequate bus service paralleling the outbound rail service (for example, at 231st Street and 238th Street on the Seventh Avenue Line).

** Different departments within the Authority use different figures to describe the number of stations, depending on the purpose for that number. The system contains 427 "stations", counting transfer complexes (like Times Square) as one "station". The Engineering Department subdivides these transfer complexes to create 465 "stations" (to provide a structure-oriented criteria for capital project programming) and the Stations Department similarly creates 461 "stations" (to provide a control area-oriented criteria for consistent reporting of passenger revenues). The RTSSS data base was aggregated over 435 "stations" to facilitate service planning.

Passenger volumes vary tremendously between stations---about 109,000 passengers entered the system at Grand Central Station complex on a typical weekday in October 1982, while only 122 passengers entered at Dean Street on the Franklin Shuttle Line. The level of ridership at any station is affected by geographic factors, such as demographics, neighboring land uses, population and employment density, and operational factors, such as the frequency and routing of available bus and rail services.

Passenger congestion results from irregular passenger volumes temporarily exceeding the design capacity of some aspect of a station's physical facility (stairways, corridors, ramps, etc.) or the design capacity of its fare control mechanisms (two-way and one-way turnstiles, passgates, slamgates, high-turnstile entrances and exits).

Ideally, the physical configuration and operating hours of station entrances and fare control facilities should be arranged to minimize station congestion and provide the greatest possible convenience for the maximum number of riders. In general, the greatest possible convenience is achieved by providing a station entrance that is closest to the origins and/or destinations of the majority of the station's users.

The constraints affecting the achievement of these ideals include the fixed location of existing entrances and facilities, the cost of operation, consideration of passenger security and limited capital funds. The analysis sought to identify station access improvements that could be achieved at little or no cost to the Authority, primarily by altering the present operating hours of control areas.

The RTSSS station access analysis was not intended as a comprehensive review of all rapid transit stations. Such a review would have exceeded the resources allocated to the Study. Instead, the Study selected 14 prototype stations and one rail line for study to develop a methodology which would be used in subsequent station access efforts. The prototype stations and line were selected to typify certain station access characteristics and situations, including passenger volume and peaking characteristics, intermodal transfer volumes, the physical configuration of the station, and levels of train service provided. The selection of prototypes also considered neighboring land use and long-term trends in station ridership and neighborhood demographics. Special consideration was given to stations with known access problems identified by community input or rider complaints.

Station Access Data Base

The RTSSS data base describes passenger travel patterns both before entering and after leaving the rapid transit system. This provided pertinent information for the station access analysis relating to the service area, physical

configuration, mode of access, and hourly usage of each station. The portions of RTSSS data base assembled for station access analysis are described in this section.

Service Areas

The geographic area served by a given station was defined by the trip origin and destination information gathered by the systemwide survey. This information was coded by zone (see Chapter II for the details regarding the development of zones and the coding process) and profiles were developed to delineate the origin and destination zones for riders beginning or ending their trips, respectively, at each station.

In addition to the zonal data, passenger origin maps were created for selected stations and areas to graphically present the spatial distribution of trip origins for a particular station. The passenger origin maps delineated the originating address of each passenger by a dot on a NYDCP base map. Maps were prepared for both peak and offpeak periods. The maps were used to examine the market area for stations and to investigate how passengers choose between different stations or lines.

Station Configuration

Schematic diagrams were prepared for every station. Based on field observations, the diagrams show the layout of stairways, elevators, escalators, pedestrian ramps, token booths and turnstiles, as well as the operating hours of all control areas. Streets and land uses in the station area are described and intermodal connections are identified.

Mode of Access

Profiles were created for each station describing the mode used by riders to access or leave each station.

Hourly Usage

Hourly turnstile registrations were collected at each control area between 6AM and 2PM during the systemwide survey. Other sources of turnstile registrations were referred to during the Study included:

- 0 The Traffic Study, produced by the Stations Department and Accounting Department, which provides semi-annual summaries of weekday ridership by hour by control area.

0 The 406 Reports, also produced by the Stations Department and Accounting Department, which provide daily, monthly, and annual summaries of ridership by station.

0 The Ranking of Stations and Controls Half Fare Ticket Program, produced by the Engineering Planning Department, which provides ridership figures relating to senior citizens and passgate admissions.

0 Transfer volumes at stations were collected as part of the systemwide survey and by Operations Planning's ongoing data collection efforts.

VI CONCLUSIONS

As a result of the Rapid Transit Service Sufficiency Study, the Authority has assembled some of the tools necessary to guide decisions regarding its rapid transit route structure--an extensive data base describing current trip patterns and the operational characteristics of the rapid transit system. The value of this data base has already been proven by its frequent use in answering ongoing route and service planning questions.

The Study is not a comprehensive review of service sufficiency. Such a review would include assessments of the many factors beyond train routing that affect the quality of rapid transit service. These factors include the age and condition of the physical infrastructure and rolling stock, operating procedures, and the extent to which existing services can be made more reliable. The route and service changes developed by the Study will not improve service sufficiency from the passenger's perspective unless they are implemented concurrently with additional improvements in the reliability and quality of rapid transit service, which the Authority intends to pursue as part of its ongoing efforts of planning operations.

It may be some time before the Authority can consider the proposals outlined in this report for implementation. The Authority's highest priorities are to restore the structural integrity of the rapid transit system and to improve service reliability to acceptable levels. These efforts that must take precedence over any service changes that do not directly address these basic priorities. Meanwhile, the Authority will focus on other aspects of service sufficiency that directly affect improving the state of the system.

The data collected by the Study will continue to be valid for analysis. While passenger volumes have changed, the percentage distribution of ridership at each station will remain relatively constant unless there are substantial changes in system configuration or population demographics; the New York City region has not experienced changes of this magnitude since 1979. This is consistent with industry standards for such data.

The Authority will use the data base compiled in the course of this study in its ongoing service planning efforts. The proposals outlined herein will be periodically reevaluated as potential elements of future service improvement proposals designed to address the overriding priority of the Authority: providing efficient and reliable transit service to New York City.

APPENDIX A Description of Output Tables

Output tables were created for the 6AM to 2PM, 6AM to 10AM, and 11AM to 2PM, time periods, with the exception of the Tables 8A, 9, 9A, 10, and 12, which provide hourly summaries.

Survey data is presented to represent both the actual number of cards received for each particular response (under the column marked "count") and the number of trips (i.e., the weighted value) that the card represent (under the column marked "trips"). Most of the tables used various cut-off values to limit table size and to avoid printing large numbers of lines representing only a single response. For example, the table showing station-to-station trips by origin station did not print lines which represented less than 0.5 percent of all trips originating at a station. The table also used a "line cut-off value", which eliminated a typical station-to-station travel patterns (i.e., unusual trains and transfer stations) representing less than 0.3 percent of the station total.

Cut-offs were determined by experimenting with different cut-off values for a portion of each table, and seeing how many trips at each station were not being printed. Tables 1 and 1A were printed with and without cutoffs, so that a complete 0-D table would be available.

Table 1: Origin to All Destinations - by Origin Station

This table shows the number of trips being made from each station to all other stations. For each origin station, destinations are ordered by volume.

EXAMPLE:

11AM to 2PM ORIGIN: 95 ST-4 AV			
DESTINATION STATION	COUNT	TRIPS	PERCENT
34ST-6AV	9	70	14.6
CITY HALL	4	30	6.3
COURT ST	4	27	5.6

This shows that nine respondents said they were going from 95th Street to 34th Street/Sixth Avenue, representing a total of 70 actual trips or 14.6 percent of all trips originating at 95th Street.

Destinations From All Origins - by Destination Station

Table 1A:

This table uses the same data as Table 1, but describes each station as a destination, showing the origin of all riders going to that station. For each destination, origin stations are ordered by volume.

EXAMPLE:

11AM to 2PM ORIGIN: 95 ST-4 AV			
ORIGIN STATION	COUNT	TRIPS	PERCENT
TIMES SQ	2		
LAWRENCE	2	35	10.2
DEKALB AV	2	26	7.4
		25	7.4

This shows that two respondents said they were going to 95 Street starting out from Times Square, which represented 35 actual trips, or 10.2 percent of all trips going to 95 Street.

Station-to-Station Trips

Table 2:

This table expands on the information summarized in Table 1 by showing the destinations from each origin station and a description of how each trip is made. The table shows what train is taken at the origin station, where transfers are made, and what trains are used to complete the trip.

EXAMPLE:

6AM to 10AM ORIGIN: 95 ST-4 AV

ORIGIN	DEST	ON	STN#1	LNE	STN #2	LNE	STN #3	LNE	OFF	CNT	TRPS	%
95ST-4V	TIMES SQ	RR	59ST-4AV	N	-	-	-	-	N	24	91	2.4
95ST-4V	TIMES SQ	RR	-	-	-	-	-	-	RR	10	31	1.0
95ST-4V	TIMES SQ									34	122	3.4
DESTINATION TOTAL												

This shows that 24 riders went from 95th Street to Times Square by first getting on the "RR" and then transferring to the "N" train at 59th Street. Another 10 riders made the same trip by taking the "RR" all the way, for a total of 34 responses going from 95th Street to Times Square, representing 122 trips in the system, or 3.4 percent of the total ridership entering at 95th Street.

Table 3:

Station-to-Zone

This table shows the trips being made from each station to each destination zone, listing the zones in order by volume. For each zone, information is given on the last station(s) used to reach that zone, and the first and last train taken.

EXAMPLE:

		6AM to 2PM	ORIGIN: CHURCH - F			
ZONE	LINE	DESTINATION STATION	LAST LINE	COUNT	TRIPS	PERCENT
133	F	50TH-8AV	CC	2	13	
133	F	ROCK CTR	F	2	14	0.3
133	F	7AV-53ST	D	1	12	0.3
133		ZONE TOTAL:		5	39	0.9

In this example, two respondents went from Church Avenue to Zone 133 by getting on the "F" train at Church and ending at Street/Eighth Avenue, after getting off the "CC". Two other respondents reached the same zone by taking the "F" directly to Rockefeller Center, while one other rider took the "D" to Seventh Avenue/53rd Street. In total, five respondents were going from Church Avenue to Zone 133, representing 39 trips in the system, or 0.9 percent of the total ridership entering at Church Avenue for the 6AM to 2PM time period.

Table 4:

Origin - Destination Links - by Zone

This table shows the number of trips being made between every pair of zones, and the first and the last station(s) used to travel between each pair. Zones are listed in numerical order.

EXAMPLE:

6AM to 10AM

FROM ZONE 939

ORIGIN ZONE	DESTINATION ZONE	ORIGIN STATION	DESTINATION ZONE	COUNT	TRIPS	PERCENT
939	233	KBDG-IRT	BKLYN BR	2	14	0.9
939	233	KBDG-CON	CHAM-WTC	2	13	0.8
939	233	DEST. ZONE TOTAL		4	27	1.7

In this example, 14 trips were made between Zone 939 and Zone 233 by entering the system at the Kingsbridge IRT Station and getting off at the Brooklyn Bridge Station, while 13 trips were made between the same two zones by getting on the Kingsbridge Station on the Grand Concourse ("D", "CC") and getting off at the Chambers Street (IND) Station.

Table 5:

Line Segment Trips

This table presents data on trips in terms of "segments" which are groupings of stations on a line. Trips are shown from each segment in the system to every other segment, listing all the transfer stations used in each trip. Segments are listed in numerical order.

EXAMPLE:

6AM to 10AM FROM SEGMENT 2			COUNT	TRIPS	PERCENT
ORIGIN	TO SEGMENT	TRANS STN #1 TRANS STN #2			
2	25	TIMES SQ	13		
2	25	96-BWAY TIMES SQ	11	220	1.1
2	25	DESTINATION TOTAL	24	182	0.9
				402	2.0

This shows that 13 riders went from Segment 2 to Segment 25 by transferring at Times Square. Another 11 riders made the trip by transferring first at 96th Street/Broadway and then again at Times Square. In TOTAL, 24 respondents traveled from Segment 2 to Segment 25, representing a total of 402 trips, or 2.0 percent of all trips originating in Segment 2.

Line Segment Summary

Table 5A:

This table presents the same information as Table 5, without breaking trips down by transfers.

EXAMPLE: FROM SEGMENT 10

DEST. SEGMENT	6AM to 2PM			6AM to 10AM			11AM to 2PM		
	COUNT	TRIPS	PER-CENT	COUNT	TRIPS	PER-CENT	COUNT	TRIPS	PER-CENT
1	130	736	1.9	106	542	2.0	24	194	1.7

This summarizes the number of trips made from Segment 10 to Segment 1 for each of the three time periods, and shows the number of responses, the number of trips they represent, and what percent those trips are of the total number of trips originating in Segment 10.

Table 6: Origin Station Profile

This table shows for each station what zones riders were coming from, and what mode (walk, bus, etc.) they used to reach the station.

EXAMPLE: 6AM to 2PM STATION: QNS BLVD

STATION	FROM ZONE	MODE	BUS NO.	COUNT	TRIPS	PERCENT
QNS BLVD	1212	BUS	Q04A	6	31	1.0
	1212	BUS	Q049	5	21	0.7
	1212	AUTO		2	14	0.5
	1212	ALL OTHERS		3	18	0.6
	1212	ZONE TOTALS		16	84	2.8
QNS BLVD	ALL OTHERS-THIS STATION			14	78	2.6
QNS BLVD	STATION TOTALS			507	2,986	

This shows that of all riders arriving at the Queens Boulevard Station from Zone 1212, six reached the station by taking the Q4A bus, five came by the Q49, and another two arrived by auto. Three others arrived from Zone 1212 by other modes, but since the individual value of each of these responses was below the cut-off of 0.5 percent, they appear together in the "ALL OTHERS" category, rather than as individual responses. Another 14 respondents arrived at the Queens Boulevard Station from various zones other than the ones listed, and the value of each of these response was below the zonal cut-off of 1.0 percent. In total, 507 respondents entered the system at Queens Blvd, representing 2,986 actual trips.

Bus/Rail Access - First Station

Table 6A:

This shows which bus routes or rail lines (e.g., Long Island Railroad) were used to reach each station.

EXAMPLE: 6AM to 10AM 30 AVE

<u>BUS/RAIL LINE</u>	<u>COUNT</u>	<u>TRIPS</u>	<u>PERCENT</u>
NONE	259		
Q018	10	4273	92.8
Q102	7	161	3.5
UNSP	3	124	2.7
* TOTAL - BUS ONLY	20	46	1.0
		331	7.2

In this example, 259 respondents arrived at the 30th Avenue Station by means other than bus or rail. Of the ones that arrived by bus, ten came by the Q18, seven by the Q102, and three did not specify which bus they took. The bottom line summarizes the total number of passengers who arrived by bus (20 respondents representing 331 trips) and what percentage they were of the total number of people entering the station.

Table 7: Destination Station Profile

This table shows the destination (by zone) that riders went to from each station, and the mode that they used to get there.

EXAMPLE: 6AM to 2PM DEST. STATION: CANARSIE

<u>STATION</u>	<u>TO ZONE</u>	<u>MODE</u>	<u>BUS NO.</u>	<u>COUNT</u>	<u>TRIPS</u>	<u>PERCENT</u>
CANARSIE	425	WALK		1	11	1.2
	425	BUS	B006	1	6	0.6
	425	BUS	B042	1	25	2.6
	425	ZONE TOTALS		3	42	4.4

In this example, of the respondents leaving the subway at the Canarsie Station and going to Zone 425, one reached the zone by walking, one took the B6 bus, and one took the B42.

These three responses represented 42 trips, or 4.4 percent of all trips ending at the Canarsie Station.

Table 7A:

This table shows all the bus or rail lines used by exiting passengers.

EXAMPLE:

6AM to 10AM		34 ST - 6 AV		
BUS/RAIL LINE	COUNT	TRIPS	PERCENT	
NONE	5,071			
M016	51	35,346		
LIRR	21	305	98.7	
CONR	7	131	0.8	
* TOTAL - BUS ONLY	51	31	0.4	
		305	0.1	
			0.8	

This shows that of all the respondents leaving the system at 34th Street/Sixth Avenue, 5,071 reached their final destinations by means other than bus or rail. Of the remainder, 51 used the M16 bus, and 21 used the LIRR.

Transfer Movements

Table 8:

This table shows the number of transfers made at every station between each line and in each direction.

EXAMPLE:

6AM to 10AM		COLUMBUS CIRCLE					
STATION	DIRECTION IN	TRAIN IN	DIRECTION OUT	TRAIN OUT	COUNT	TRIPS	PERCENT
COLCIRC	SB	01	NB	A	20	107	0.3
	SB	01	NB	D	20	136	
	SB	01	SB	A	77	706	0.4
	SB	01	SB	B	13	102	2.3
	SB	01	SB	CC	9	69	0.3
SB DIRECTION TOTAL					4,006	25,482	81.2

This shows that of the respondents transferring at Columbus Circle coming off the southbound #1 train, 20 transferred to the northbound A, 20 to the northbound D, 77 to the southbound A, etc. The total number of responses transferring from a southbound train was 4,006, representing 25,482 actual riders, or 81.2 percent of all transfers made of Columbus Circle in the 6AM to 10AM period.

Table 8A:

Transfer Movement Summary

This table summarizes how many riders made either zero, one, two, or three transfers to complete their trip.

Trip Origin

Table 9:

This table summarizes for each hour of the survey where riders were coming from (home, work, etc.) before they entered the subway.

Trip Purpose

Table 9A:

This table summarizes for each hour of the survey where riders were going to (home, work, etc.) after they left the subway.

Summary of Trip Movement

Table 10:

This table summarizes the total number of trips made between each borough.

Made of Access - Elderly and Handicapped - First Station

Table 11:

This table shows the mode of access used by elderly and handicapped riders to reach each station for the three time periods (6AM to 10AM, 11AM to 2PM, 6AM to 2PM). Only the top 20 percent of the stations are printed out, and the numbers that appear are all weighted trips (not actual responses).

Made of Access - Elderly and Handicapped - Last Station

Table 11A:

This table employs the same format as Table 11 to show the mode used by elderly and handicapped riders to reach their final destinations after leaving the subway.

Summary of Survey

Table 12:

This table summarizes the results of the survey and provides an hourly breakdown of the following information for each station: the number of passengers entering, the number of cards that were distributed, the number that were returned, the response rate (which is the number of cards returned divided by the number distributed) and the survey rate (which is the number of cards returned divided by the number of passengers entering).

APPENDIX B
Passenger Benefit Matrices

At the request of the MTA/PCAC, the study staff constructed a series of matrices to describe the benefits and disbenefits of each RTSSS proposal in outline form, which are presented in the following pages. N.B.: the passenger demand figures presented in the matrices may vary from the figures presented in the RTSSS final report. This is because the figures presented in the matrices reflect 24-hour ridership, while the figures used in the report reflect observed ridership during the survey period (6AM to 10AM and 11AM to 2PM).

WASHINGTON HEIGHTS, CENTRAL PARK WEST, EASTERN DIVISION
AND SIXTH AVENUE ROUTE AND SERVICE IMPROVEMENT PACKAGE

BENEFITS

1. PROVIDES DIRECT SERVICE
CONSISTENT WITH DEMAND
BETWEEN SIXTH AVENUE
AND:
- WASHINGTON HEIGHTS

IMPACTS FOR RIDERS

WASHINGTON HTS/CENTRAL PARK WEST RIDERS
LOCAL STOPS (163St-72St)
OFFPEAK (Weekdays)

Present:
"AA": Eighth Avenue Local
- 3,800 must transfer for
Sixth Avenue destinations.

Proposed:
"B": Sixth Avenue Express
- These riders have
direct service to
Sixth Avenue destinations.

EXPRESS STOPS (168St-59St)
OFFPEAK (Weekdays)

Present:
"A": Eighth Avenue Express
"AA": Eighth Avenue Local
"D": Sixth Avenue Express
- 2/3 of service provides
direct service to Eighth
Avenue for 3,400.
- 1/3 of service provides
direct service to Sixth
Avenue for 6,200.

Proposed:
"A": Eighth Avenue Local
"B": Sixth Avenue Express
"D": Sixth Avenue Express
- 2/3 of service provides
direct service to Sixth
Avenue for 6,200.
- 1/3 of service provides
direct service to Eighth
Avenue for 3,400.

- CANARSIE

14ST-CANARSIE RIDERS
(Atlantic Av-Rockaway Pkwy)
PEAK

Present:
"LL": 14St Local
- 2,800 must transfer for
Sixth Avenue destinations.

Proposed:
"K": Sixth Avenue Local
"LL": 14St Local
- These riders have direct
direct service to
Sixth Avenue destinations.

- BROADWAY-BROOKLYN

BROADWAY-BROOKLYN RIDERS
(Marcy Av-Eastern Pkwy)
PEAK

Present:
"J": Nassau St Local
"M": Nassau St Local
- 5,900 must transfer for
Sixth Avenue destinations.

Proposed:
"J": Nassau St Local
"K": Sixth Avenue Local
"M": Nassau St Local
- These riders have direct
direct service to
Sixth Avenue destinations.

IMPACTS FOR RIDERS

BENEFITS

BROADWAY-BROOKLYN RIDERS (Marcy Av-Myrtle Av) OFFPEAK (Weekdays)

Present:

"J": Nassau St Local
"M": Nassau St Local
- 2,000 must transfer for
Sixth Avenue destinations.

Proposed:

"K": Sixth Avenue Local
"M": Nassau St Local
- These riders have
direct service to
Sixth Avenue destinations.

JAMAICA AVENUE

BROADWAY-BROOKLYN/JAMAICA AV RIDERS (Kosciusko St-Queens Blvd) OFFPEAK (Weekdays)

Present:

"J": Nassau St Local
- 1,800 must transfer for
Sixth Avenue destinations.

Proposed:

"K": Sixth Avenue Local
- These riders have
direct service to
Sixth Avenue destinations.

1. PROVIDES A SIMPLIFIED
"B" SERVICE PATTERN.
PATTERN.

Present:

4 "B" route variations
in Manhattan.

Proposed:

1 "B" route
in Manhattan.

2. EXTENDS "J" PEAK
EXPRESS SERVICE.

Present:

"J" Express:
Marcy Avenue-Myrtle Avenue

Proposed:

"J" Express:
Marcy Avenue-Eastern Parkway
- Shortens travel time by
three minutes for
13,000 weekday riders.

3. MORE FREQUENT SERVICE
TO 57 STREET-SIXTH AVE.

Present:

"B": Sixth Avenue Local
- 2,500 have irregular peak
service with headways up to
19 minutes between trains.

Proposed:

"K": Sixth Avenue Local
- These riders have
regular peak service with
no headway greater than
10 minutes.

4. PROVIDES OFFPEAK
"A" SERVICE TO
50 STREET, 23 STREET
AND SPRING STREET.

Present:

400 weekday offpeak riders
from these stops must transfer
to reach "A" stops south of
Chambers Street.

Proposed:

These riders will have
direct service offpeak.

5. SIMPLIFIES OFFPEAK
SERVICE AT
34 STREET-SIXTH AVE.

Present:

"A": Express Platform
"AA": Local Platform
"E": Local Platform
- 11,000 must guess where
next Eighth Avenue train
will stop.

Proposed:

"A": Local Platform
"E": Local Platform
- All offpeak trains will
stop at the local platform,
simplifying service for
11,000.

BENEFITS	IMPACTS FOR RIDERS		
<p>PROVIDES DIRECT SERVICE BETWEEN MYRTLE AVENUE LINE AND MANHATTAN AT ALL TIMES (EXCEPT NIGHTS).</p>	<p><u>MYRTLE AVENUE LINE RIDERS</u> (Myrtle Av-Metropolitan Av) 9PM to 12PM (Weekdays)</p> <table> <tr> <td> <p>Present:</p> <p>"M" Shuttle: Myrtle-Metropolitan Avs - 1,700 must transfer to/from Manhattan.</p> </td><td> <p>Proposed:</p> <p>"M": Nassau St Local to Broad St, Manhattan - These riders have direct service to Manhattan.</p> </td></tr> </table>	<p>Present:</p> <p>"M" Shuttle: Myrtle-Metropolitan Avs - 1,700 must transfer to/from Manhattan.</p>	<p>Proposed:</p> <p>"M": Nassau St Local to Broad St, Manhattan - These riders have direct service to Manhattan.</p>
<p>Present:</p> <p>"M" Shuttle: Myrtle-Metropolitan Avs - 1,700 must transfer to/from Manhattan.</p>	<p>Proposed:</p> <p>"M": Nassau St Local to Broad St, Manhattan - These riders have direct service to Manhattan.</p>		
DISBENEFITS	IMPACTS FOR RIDERS		
<p>1. REQUIRES SOME RIDERS THAT HAVE DIRECT SERVICE TO TRANSFER.</p>	<p><u>WASHINGTON HTS/CENTRAL PARK WEST RIDERS</u> <u>LOCAL STOPS (163St-72St)</u> OFFPEAK (Weekdays)</p> <table> <tr> <td> <p>Present:</p> <p>"AA": Eighth Avenue Local - 1,800 have direct service to Eighth Avenue destinations.</p> </td><td> <p>Proposed:</p> <p>"B": Sixth Avenue Express - These riders must transfer for Eighth Avenue destinations.</p> </td></tr> </table>	<p>Present:</p> <p>"AA": Eighth Avenue Local - 1,800 have direct service to Eighth Avenue destinations.</p>	<p>Proposed:</p> <p>"B": Sixth Avenue Express - These riders must transfer for Eighth Avenue destinations.</p>
<p>Present:</p> <p>"AA": Eighth Avenue Local - 1,800 have direct service to Eighth Avenue destinations.</p>	<p>Proposed:</p> <p>"B": Sixth Avenue Express - These riders must transfer for Eighth Avenue destinations.</p>		
<p>2. LENGTHENS PEAK "LL" HEADWAYS AT CANARSIE.</p>	<p><u>BROADWAY-BROOKLYN/JAMAICA AV RIDERS</u> (Kosciusko St-Queens Blvd) OFFPEAK (Weekdays)</p> <table> <tr> <td> <p>Present:</p> <p>"J": Nassau St Local - 2,100 have direct service to Nassau St destinations.</p> </td><td> <p>Proposed:</p> <p>"K": Sixth Avenue Local - These riders must transfer for Nassau St destinations.</p> </td></tr> </table> <p>Average peak "LL" headways will go from five to seven minutes to accommodate "K" service. Addition of the "K", however, provides a net increase in peak Canarsie service. Some peak "LL" trains will originate or terminate at Atlantic Avenue, so headways between 8Av-14St and Eastern Pkwy will not be affected.</p>	<p>Present:</p> <p>"J": Nassau St Local - 2,100 have direct service to Nassau St destinations.</p>	<p>Proposed:</p> <p>"K": Sixth Avenue Local - These riders must transfer for Nassau St destinations.</p>
<p>Present:</p> <p>"J": Nassau St Local - 2,100 have direct service to Nassau St destinations.</p>	<p>Proposed:</p> <p>"K": Sixth Avenue Local - These riders must transfer for Nassau St destinations.</p>		
<p>3. ELIMINATES OFFPEAK EIGHTH AVENUE EXPRESS S. OF COLUMBUS CIRCLE.</p>	<p>Travel time for through riders will increase by about two minutes, offpeak.</p>		
<p>4. REDUCES OFFPEAK EIGHTH AVENUE SERVICE AT EXPRESS STOPS.</p>	<p>Only 2/3 of the present service ("A" & "E") will provide service at Eighth Avenue express stops.</p>		

QUEENS BLVD-ASTORIA ROUTE AND
SERVICE IMPROVEMENT PACKAGE

IMPACTS

24-hour service between
Queens Blvd. Line and
Broadway Line.

IMPACT ON RIDERS

(Evenings and
weekends)

QUEENS BLVD. LOCAL RIDERS

Present:

3% direct trip
97% must transfer
(55% must transfer
twice)

Proposed:

32% direct trip
68% must transfer
(virtually none must
transfer twice)

Service pattern consistent
with identified demand.

Note: Assumes a consistent
"N" service pattern, with all
Queens Island "N"s operating
Express on Broadway, Coney Is.
"N"s currently operate local
on Broadway in the direction
of the Queens rush hour.
This is an inconsistent, and
therefore undesirable, interim
service procedure designed to
accommodate the heavy demand
from Queens Blvd. to Broadway
local stations.

QUEENS BLVD-BROADWAY RIDERS (6 AM-10 AM)

Present (see note*):

"N": Broadway Ex-
press with local to
Whitehall Street.
-36,000 may use any
train.

Proposed:

"RR": Broadway Local
-43,000 may use any
train.

- 7,000 must use only
Whitehall train.

ASTORIA-BROADWAY RIDERS (6 AM-10 AM)

Present:

"RR": Broadway local
- 22,000 may use any
train.

Proposed:

"N": Broadway Express
"V": Local to White-
hall Street.

- 19,000 may use any
train.

- 3,000 must use
only "V" train.

3. Provides a simplified
service pattern.

Present:

7 "N" route vari-
ations

1 "RR" route vari-
ation

Proposed:

1 "N" route vari-
ation

1 "RR" route vari-
ation

1 "V" route vari-
ation.

BENEFITS

Extends the hours of "F" express service to Forest Hills from 11 PM to 1 AM.

Relieves peak overcrowding on "E" and "F" by providing additional service to Whitehall Street.

Relieves overcrowding and long waits on "GG" evenings and weekends by providing two local services on Queens Boulevard until 9 PM, weekdays (8 PM, Sat.; 7 PM Sun.).

7. Provides thru service to 57th St./6th Ave. and to Sea Beach Line stations at all times.

IMPACT ON RIDERS

9,000 daily riders will have one additional service north of Queens Plaza (11 PM-1 AM)

Present:

12 min. local headways.
12 min. express headways.

Proposed:

12 min. local headways.
6 min. express headways.

QUEENS CORDON COUNT (6 AM-10 AM)

Present:

112,000 "E"/"F"
35,000 "N"

Proposed:

111,000 "E"/"F"
36,000 "RR"

LOCAL QUEENS BLVD (8 PM-9 PM Weekdays)

Present:

Avg. 70 pass/car on "GG", alone (12 min. local headways).

Proposed:

Avg. 35 pass/car on "GG"/"RR" (6 min. local headways).

LOCAL QUEENS BLVD (Daytime, Weekends)

Present:

10 to 12 minute Local headways

Proposed:

5 to 6 minute Local headways

SEA BEACH LINE & 57th ST/6th AV (1 AM-5 AM)

PRESENT:

900 daily passengers must transfer for thru service.

PROPOSED:

These passengers have thru service from these stations. 57th St./6th Ave. usage may increase, improving passenger security.

BENEFITS

Provides a 24-hour transfer between the Queens Blvd. and Lexington Ave. Lines.

IMPACT ON RIDERS

LOCAL QUEENS BLVD RIDERS (Evenings-Weekends)

Present:

20% of riders must make two transfers and/or use circuitous routing to reach Lexington Ave. destinations.

Proposed:

Direct service to 59th/Lexington. One transfer required for other Lexington Ave. destinations.

BENEFITS

Requires off-peak riders between Astoria and Broadway local stations to transfer.

IMPACT ON RIDERS

ASTORIA (11 AM-2 PM)

Present:

1700 direct trips
1400 must transfer

Proposed:

1400 direct trips
1700 must transfer

2. Requires evening riders between the Crosstown Line and the Queens Blvd. Line to transfer (9 PM-11 PM, weekdays; 8 PM-11 PM, Sat.; 7 PM-11 PM, Sun.).

Weekdays (9 PM-11 PM)

Present:

120 passengers have direct trips.

Proposed:

These passengers must transfer at Queens Plaza.

1. Requires riders between 6th Ave. and Queens Blvd. Lines to transfer between 1 AM and 5 AM or use "RR" 7th Ave. service.

Weekdays (1 AM-5 AM)

Present:

400 passengers have direct trips.

Proposed:

These passengers must transfer at 7th Ave./53rd St., 34th St./6th Ave. or walk to 7th Ave. for "RR" service.

SOUTHERN DIVISION SERVICE IMPROVEMENT PACKAGE

BENEFITS	IMPACTS FOR RIDERS
PROVIDES DIRECT SERVICE BETWEEN THE WEST END LINE AND: - LOWER MANHATTAN - DOWNTOWN BROOKLYN	<u>WEST END LINE RIDERS</u> A.M. PEAK
	<div>Present:</div> <div>"B": Sixth Avenue Local/Express -3,200 must transfer for Lower Manhattan & Downtown Brooklyn.</div> <div>Proposed:</div> <div>"B": Sixth Avenue Express "T": Nassau Street Local -These riders have direct service.</div>
2. REDUCES PEAK CROWDING ON WEST END LINE SERVICES.	<u>PASSENGER LOADINGS THROUGH 36 STREET/4 AVENUE</u> (7:20 to 8:45 AM)
	<div>Present:</div> <div>"B": Sixth Avenue Local/Express -Average of 112 passengers/car.</div> <div>Proposed:</div> <div>"B": Sixth Avenue Express "T": Nassau Street Local -Average of 94 passengers/car -Net Change: -18 passengers/car</div>
3. PROVIDES A SIMPLIFIED "RR" SERVICE PATTERN.	<div>Present:</div> <div>2 "RR" Routings in Brooklyn: -Broadway Local - Nassau Street Local</div> <div>Proposed:</div> <div>1 "RR" Routing in Brooklyn: -Broadway Local</div>
DISBENEFITS	IMPACTS FOR RIDERS
1. REMOVES DIRECT SERVICE BETWEEN FOURTH AVENUE LINE (45 STREET-95 STREET) AND NASSAU STREET STATIONS.	<u>FOURTH AVENUE LINE (45 STREET-95 STREET)</u> A.M. PEAK
	<div>Present:</div> <div>"RR": Broadway Local "RR": Nassau Street Local -1,100 have direct service to Nassau Street.</div> <div>Proposed:</div> <div>"RR": Broadway Local -These riders must transfer or use the Broadway Local service to Lower Manhattan "RR" stations two blocks away.</div>
2. SLIGHTLY INCREASES STANDEES BELOW 36 STREET ON THE FOURTH AVENUE "RR" LINE.	<u>PASSENGER LOADINGS THROUGH 36 STREET/4 AVENUE</u> (7:20 to 8:45 AM)
	<div>Present:</div> <div>"RR": Broadway Local "RR": Nassau Local -Average of 60 passengers/car.</div> <div>Proposed:</div> <div>"RR": Broadway Local -Average of 73 passengers/ca -Net Change: +13 passengers/car.</div>

APPENDIX C

Rapid Transit Service Recommendations From The Bronx Study

Prior to the Rapid Transit Service Sufficiency Study (RTSSS), Operations Planning undertook the Borough Transit Sufficiency Study Program, a series of individual borough transit studies that were designed to appraise the overall effectiveness and sufficiency of both rapid and surface transit operations on a borough by borough basis. With the first study in the program, the Bronx Study, it became apparent that rapid transit route and service changes could not be adequately made on the borough level. Therefore, analysis of rapid transit service was shifted to a city-wide basis in a separate study. However, the Bronx Study had already analyzed Bronx rapid transit service, so a summary of its conclusions is presented here, to avoid duplication of previous efforts.

The Bronx Study conducted origin-destination surveys and analyzed the resulting data base to determine the service needs of the Borough, focusing on alternatives to the current route and service structure. A set of route and service planning guidelines and a design process were developed; these are compatible with the those employed by RTSSS.

The following route and service changes were evaluated by the Bronx Study:

- o During peak periods, operate alternating #1 trains express between 137th Street and 96th Street in the peak direction of traffic.
- o During peak periods, operate all #1 trains skip-stop between 242nd Street and 96th Street in the peak direction of traffic.
- * o During peak periods, operate all #5 trains express between East 180th Street and Third Avenue/149th Street in the peak direction of traffic. Peak period #5 trains that serve the White Plains Road Line operate express between Gun Hill Road and East 180th Street in the peak direction of traffic; additional #2 trains would be put into service at Gun Hill Road, instead of at East 180th Street.
- o Eliminate all #4 service north of Kingsbridge Road on the Jerome Avenue Line, closing Woodlawn, Mosholu Parkway, and Bedford Park Boulevard Stations.
- o Extend the hours of the peak period #6 Pelham Express to operate between 6:30AM and 8:00PM.

- o Between 6:30AM and 7:30PM, operate all #6 trains skip-stop between Pelham Bay Park and Hunts Point Avenue. All trains stop at Pelham Bay Park, Westchester Square, 177th Street-Parkchester, and Hunts Point Avenue Stations.
- o Between 10AM and 2PM, terminate alternating #6 trains at 138th Street.
- o During peak periods, eliminate the "CC" and operate the "D" local along the Grand Concourse Line.
- o During peak periods, eliminate the "CC" and operate alternating "B" trains to Bedford Park Boulevard.
- o Reduce the operation of the "CC" by one hour during both peak periods.

In addition, another alternative was suggested by the MTA permanent Citizen's Advisory Committee for review:

- o During peak periods, operate alternating #4 trains express along the Jerome Avenue Line.

A detailed description of these alternatives and their analysis can be found in The Bronx Transportation Study Final Report (1978).

After analysis, two alternatives were selected as preliminary service change proposals for further study and presented to the affected community boards for review:

- o During peak periods, operate all #5 trains express between East 180th Street and Third Avenue/149th Street in the peak direction of traffic. Peak period #5 trains that serve the White Plains Road Line operate express between Gun Hill Road and East 180th Street in the peak direction of traffic; additional #2 trains would be put into service at Gun Hill Road, instead of at East 180th Street.
- o Extend the hours of the peak period #6 Pelham Express to operate between 6:30AM and 8:00PM.

Community board review resulted in the modifications to the first proposal regarding #5 service. The boards opposed operating the peak period #5 trains that serve the White Plains Road Line express between Gun Hill Road and East 180th Street in the peak direction of traffic. The proposals for operating all #5 trains express between East 180th Street and Third Avenue/149th Street in the peak direction of traffic, and for extending the hours of the peak period #6 Pelham Express to operate between 6:30AM and 8:00PM were approved. Subsequently, these two changes were implemented in January, 1980.

APPENDIX D

Rapid Transit Service Sufficiency Study Staff

The Rapid Transit Service Sufficiency Study was developed and executed by the Operations Planning Group of the New York City Transit Authority, 25 Chapel Street, Room 1223, Brooklyn, New York. An undertaking such as this study relies on the work and efforts of many individuals; the following individuals were most responsible for the successful completion of this study:

Project Directors:

1978-1980	James P. Minogue, Executive Assistant for Administration - Rapid Transit
1980-1983	Dr. Alex E. Friedlander, Deputy Director for Operating Programs and Plans
1983-1984	Fred Baer, Chief, Operation Planning Group

Project Staff:

Edward Applebome, Amy Bauer, Denise Strobel Bruce, James Chin, Robert Cleveland, Steven Cooperman, Dan Finnegan, Larry Gould, T. R. Hickey, Larry Hirsch, Tommy Lee, Marian Lefkin, Marc Mednick, Judy Wagh

Final report assembled by T. R. Hickey